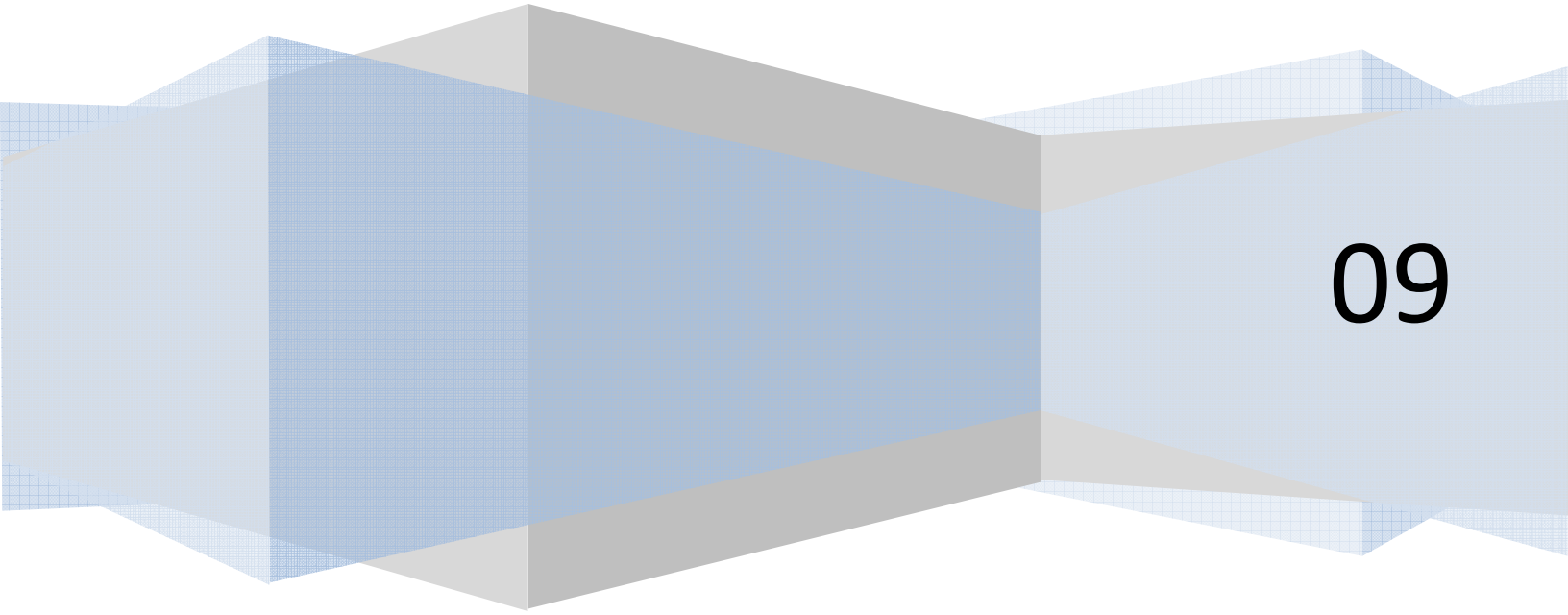
City of Seattle

CAD Manual

SPU/SDoT Inter-Departmental CAD Standard



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Introduction

The SPU/SDoT Inter-Departmental CAD Standard was set in place to ensure that all CAD drafting work performed in house or by a city-hired consultant, could be readily used by various city departments and easily translated into the city's GIS network.

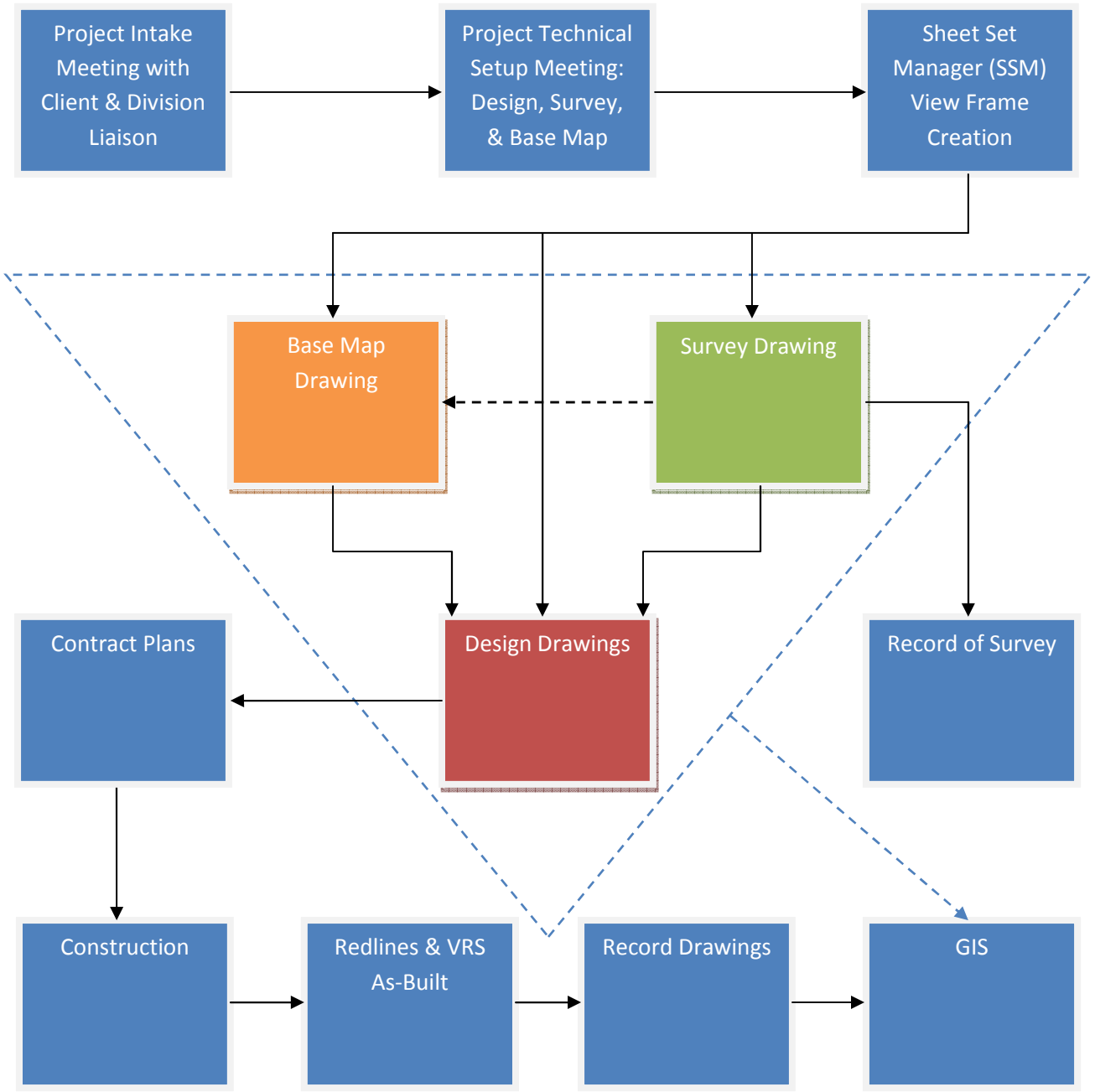
Contract plans result from the work of many specialists and engineers. A base map created by SPU Technical Resources or SDoT Drafters may be used simultaneously by Water Design, Drainage Design, Sewer Design, Roadway Design, Landscaping Design and Electrical Instrumentation Design. All the components of a project - lighting, drainage, paving, sewer and water - fit against the base map, making it possible to compare and complete various design elements in tandem. This ability to work concurrently depends on developing, maintaining and employing CAD standards. The goals of maintaining coherence, minimizing wasted effort in recreating design, and maximizing the effectiveness of a project team are all best served by adhering to the CAD standard.

Definitions of Common Acronyms

COS	City of Seattle
SDoT	Seattle Department of Transportation
SPU	Seattle Public Utilities
GIS	Geographic Information System
ERC	Engineering Records Center (Vault)
VPI	Vault Plan Index
VRS	Virtual Reference Station
RE	Resident Engineer
SSM	Sheet Set Manager
XREF	External Reference
DWF	Drawing Web Format
PERC	Preliminary Engineering Resource Composite

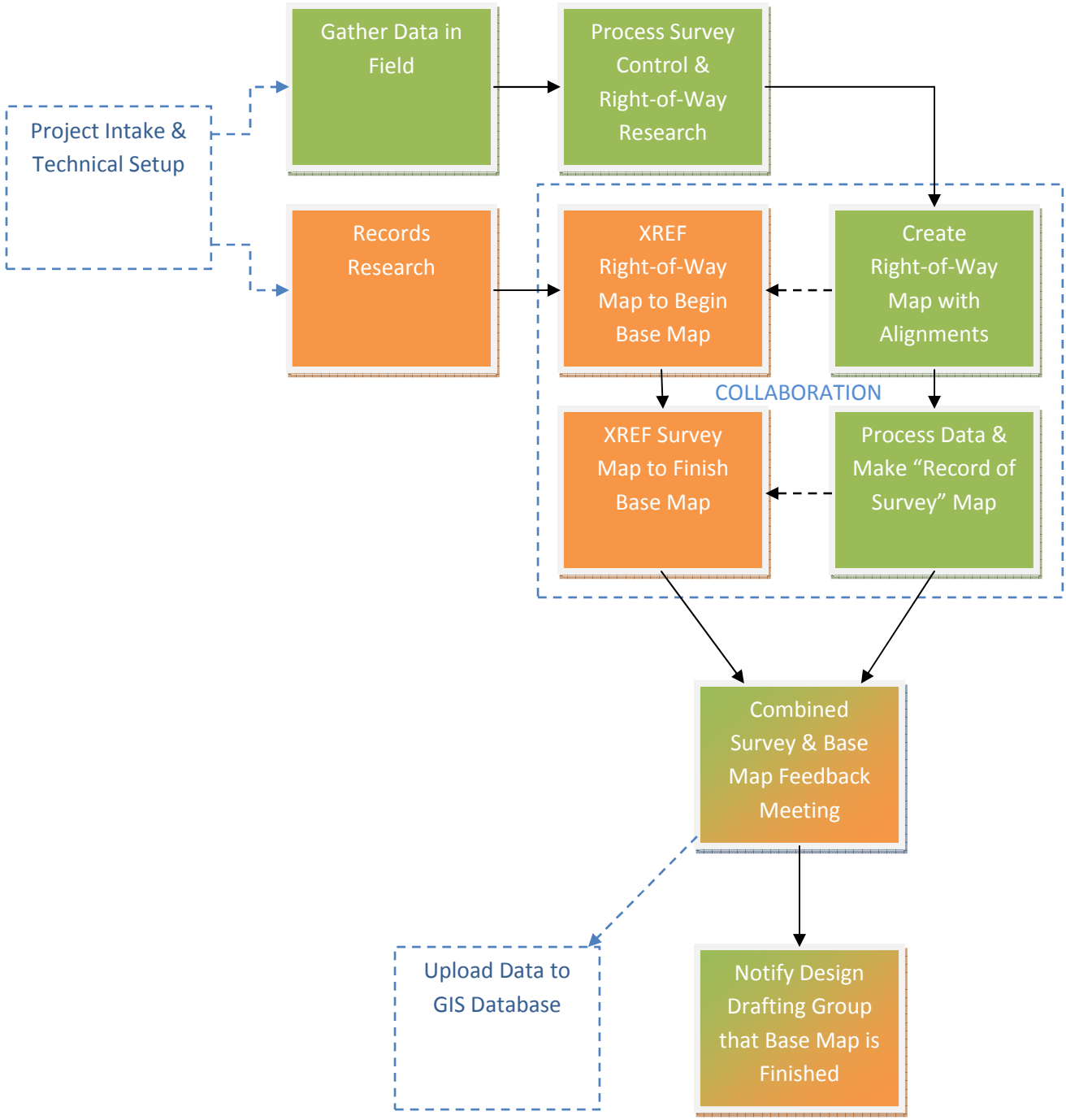
Section 1: Workflow for Civil Projects

The diagram below shows the workflow for typical civil projects.



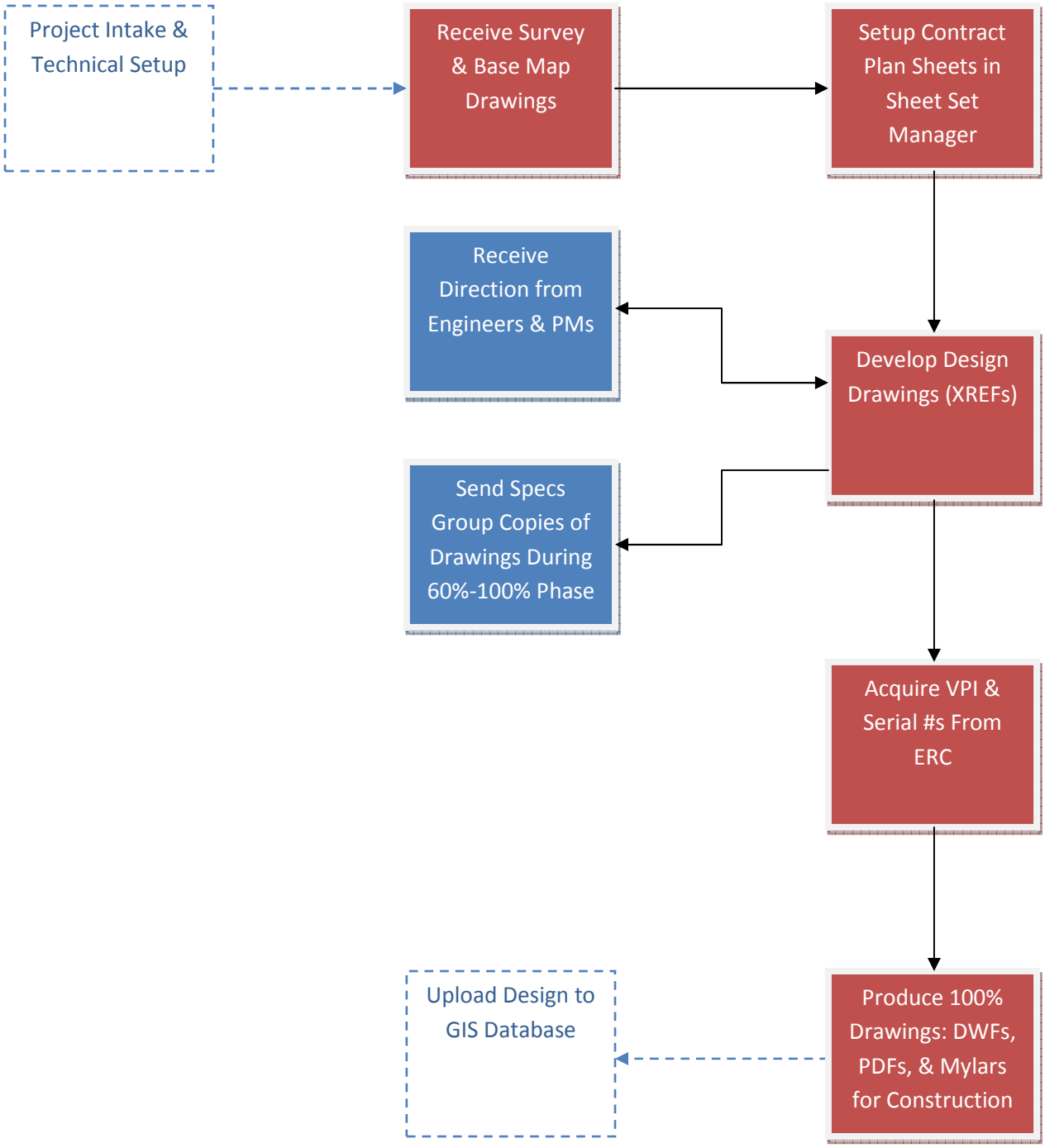
Joint Base Map Creation Workflow

The diagram below shows the typical workflow for the survey and base map groups.



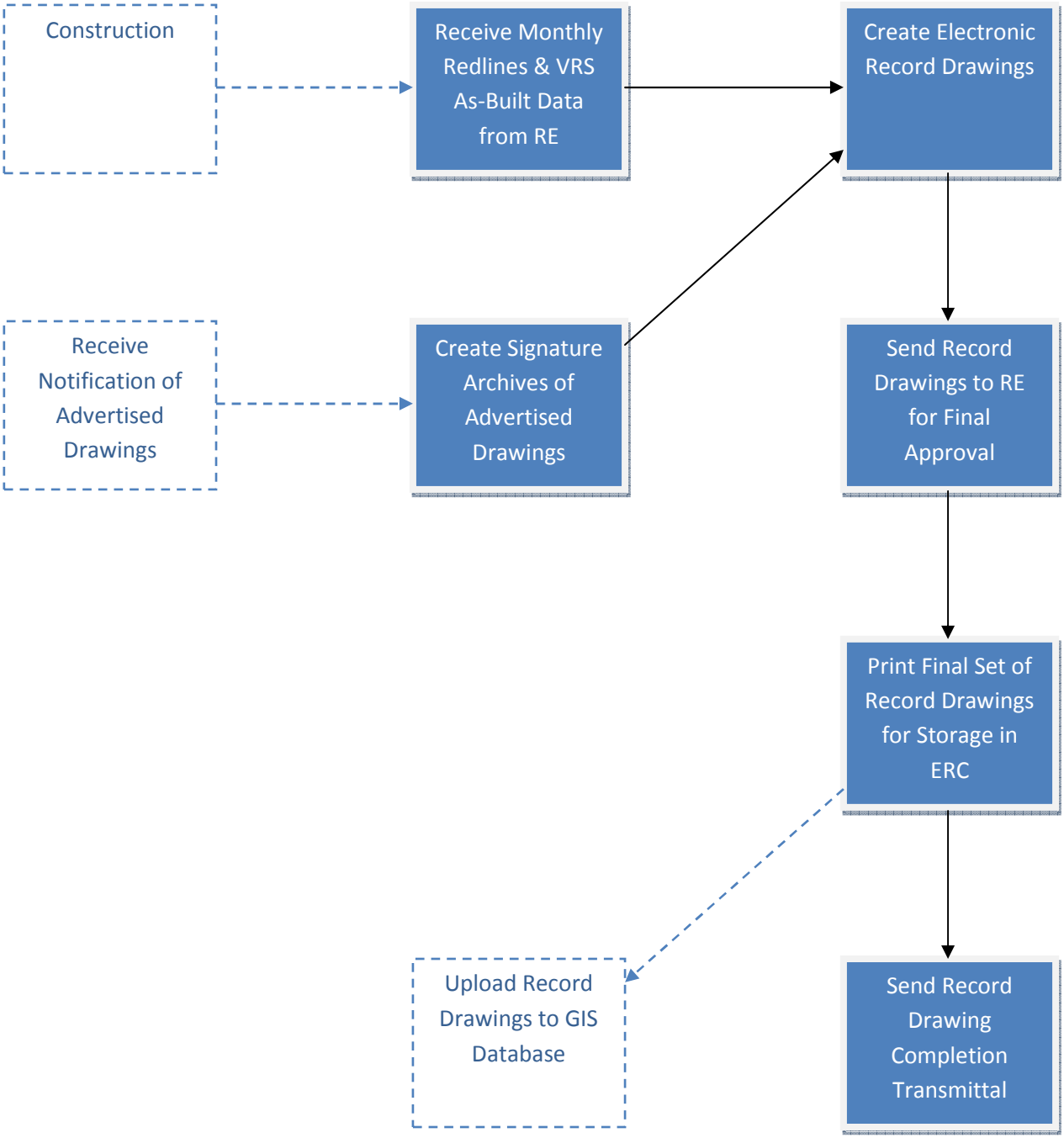
Design Drafting Workflow

The diagram below shows the typical workflow for design drafting group.



Record Drawing Workflow

The diagram below shows the typical workflow for record drawing group.



Section 2: Basic Drawing Guidelines

Overview

Every drawing should be in the world UCS with the 0,0 point defined by Survey in the Survey drawing. It is important to maintain an accurate coordinate system in order to allow the exchange of design information among the project team and allow information from different design groups to be displayed together easily. Each design drawing should be in model space (with nothing in paper space) and should have no other drawing files externally referenced into it. As you are working on your drawing, you will have the base and other design drawings externally referenced during your drawing session, but when you are complete, it is important to unload all x-refs.

General Drafting Guidelines

1. Create the design in model space at 1 drawing unit = 1 ft
2. Create each design element as a separate file
3. Create files in the appropriate folders, giving each file an appropriate name
4. XREF in (as overlays) the survey drawing, base map, and other needed design files as required on appropriate layers
5. Work in the correct horizontal coordinate system (NAVD83/91 or as defined by Survey)
6. Draft at Z = 0, design at Z = true elevation
7. Use standard COS layers, colors and linetypes
8. Use standard COS text styles and text heights
9. Abbreviations should be shown in accordance with STANDARD PLAN NO 002
10. Use standard COS blocks
11. Lettering should not be shown to identify features for which standard symbols are used, unless lettering is shown in the standard symbols
12. Features should be drawn in accordance with STANDARD PLAN NO 003
13. Do not draw on layer 0
14. Plot with COS color table (CTB)

Plan Presentation Standards

Sample drawings are available for download on the web (see Section 9).

- Cover sheet should have a vicinity map, datum block and detail & section referencing block, and may contain a location map, sheet index and notes.
- Profile views are shown above plan views. The plan and profile views should be aligned so that the improvement is in direct relationship between the two views as much as possible.
- Adjoining sheets must use match lines at an even station with the sheet number referenced.
- Dimensioning between features shown on separate sheets should be shown with double arrow-heads at the match line.
- Plan views should have a North arrow with a bar scale under it.
- North should be shown up or to-the-left.
- Use standard COS detail and section referencing callouts (for info see Appendix 5).

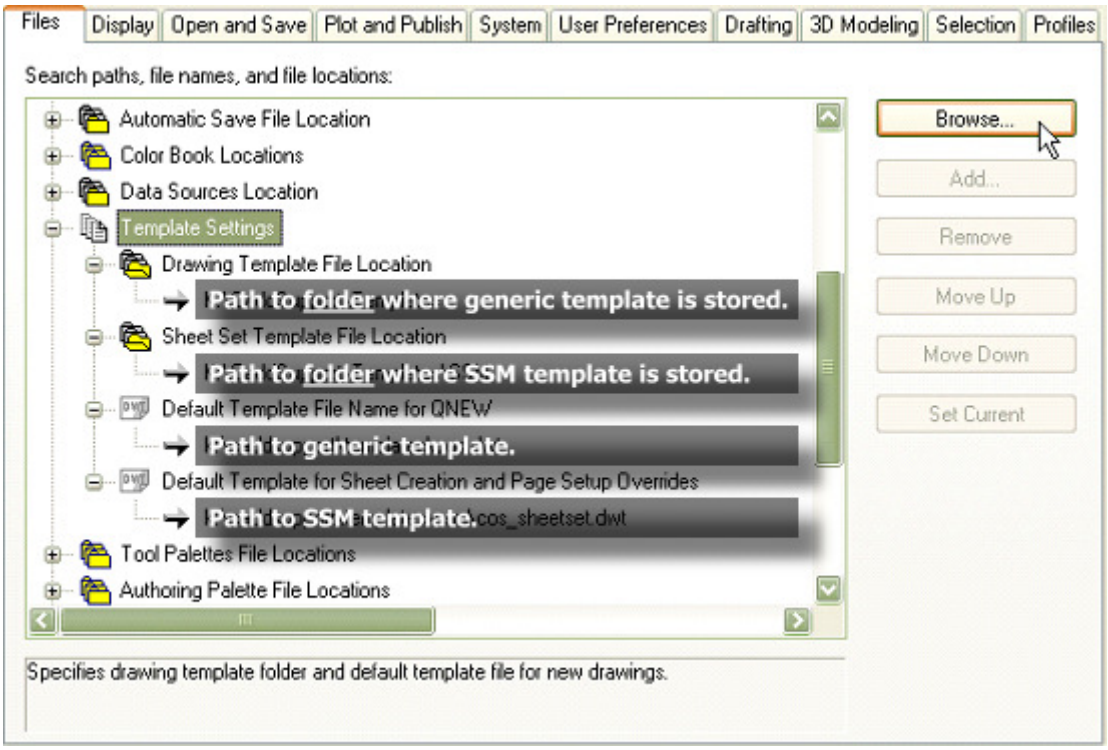
Templates

Standard SPU/SDoT Civil 3D templates can be downloaded here:

http://www.seattle.gov/util/Engineering/CAD_Resources/Templates/

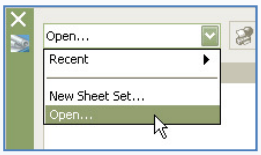
- There is a generic AutoCAD '09 template available for download.
- There are three Civil 3D '09 templates available for download; one for surveying, one for base mapping, and one for design drafting. Each template is customized for it's unique purpose.
- There is one Civil 3D '09 Sheet Set Manager template (.dwt) and an accompanying .dst file available for download. **Before you use the Sheet Set Manager template, you will need to make a few changes to the .dwt and .dst files.** Open the .dwt file and modify the page setups to work with your plotters and printers. You will also need to modify the .dst file (see tips on the next couple of pages).

Once you have downloaded the templates, make sure AutoCAD Civil 3D template settings point to where the templates are stored. Type OPTIONS on the command line, click on the "Files" tab, and then expand the "Template Settings" section:



Tip: Setup Sheet Set Manager .dst File Outside the City Network

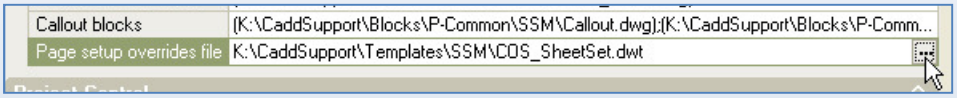
Before you start using Sheet Set Manager, you need to make a few changes to the .dst file. To do this start up Sheet Set Manager (command: SSM) and open the COS_SheetSet.dst file through SSM.



Right-click on “COS_SheetSet” in SSM and select “Properties…”

Page Setup Overrides File

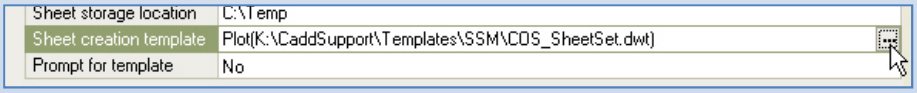
Click the ellipsis (…) button next to the “Page setup overrides file” field .



Browse to the location where COS_SheetSet.dwt is stored and click Open.

Sheet Creation Template

Click on the ellipsis (…) button next to the “Sheet creation template” field.



Then click on the ellipsis button in the next dialog box to browse to the location where you stored COS_SheetSet.dwt.

Click Open.

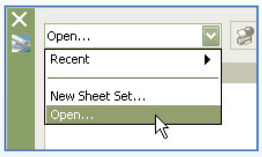
Click OK.

Finally click OK to save and close the Sheet Set Properties.

Tip: Setup Sheet Set Manager Callout Blocks Outside the City Network

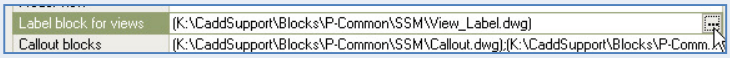
There are callout blocks associated with the City of Seattle SSM template and in order to use them you need to download the blocks and save them in a folder on your network or computer. Once you have done this you will need to tell SSM where to find them.

To do this start up Sheet Set Manager (command: SSM) and open the COS_SheetSet.dst file through SSM.

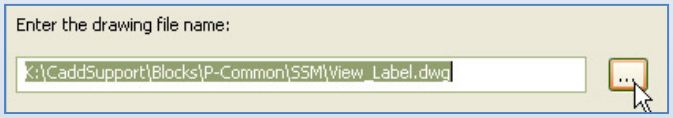


Right-click on "COS_SheetSet" in SSM and select "Properties…"

First click on the ellipsis (…) button next to the "Label block for views" field.

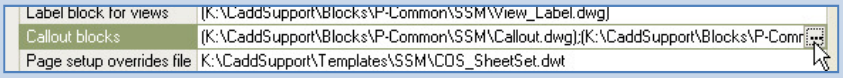


In the resulting dialog box click on the next ellipsis (…) button.



Browse to the folder where you saved the SSM callout blocks and select View_Label.dwg. Click Open. Click OK in the "Select Block" dialog box.

Then select the ellipsis (…) button next to the "Callout blocks" field (see following picture).



You will find a list of paths pointing to blocks. Delete all of them. You will then need to add the folder paths for all the blocks (except the View_Label.dwg block) so SSM knows where to find them on your network or computer.

Click the "Add…" button. Then click the ellipsis (…) button in the "Select Block" dialog box. Select a block (not the View_Label.dwg block) and click "Open". Repeat this for all blocks except the View_Label.dwg block.

Click OK.

Section 3: Project Data Sharing

Sharing project data amongst team members is an essential part of concurrent engineering. There are three core elements of AutoCAD that enable drawing/data sharing: XREFs, Data Referencing, and Sheet Set Manager.

Key

- [WA #] = Work Authorization Number
- [milestone] = Project percentage milestone
- # = Sheet Number

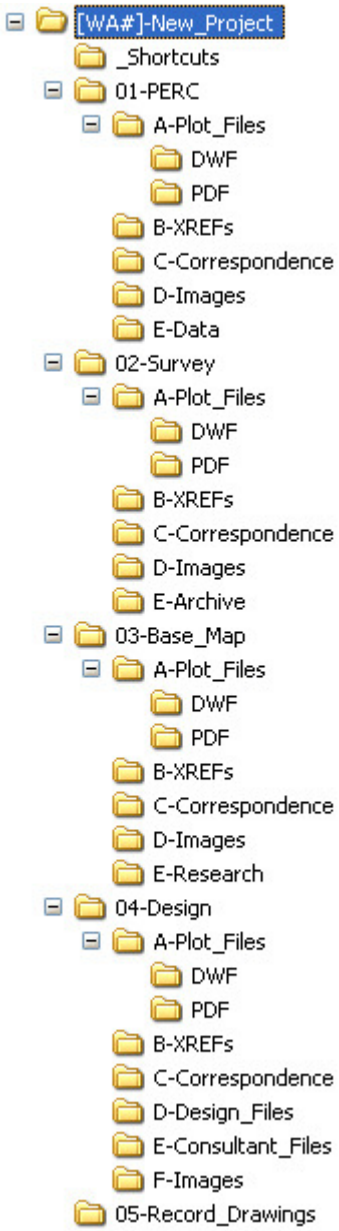
Folder Structure

Having an agreed-upon folder-structure allows all CAD and Survey Technicians to work in one place. All XREFs, Data Shortcuts, and Sheets for the project reside in the same place and are available for all to reference. The parent folder that SPU and SDoT use is: **P:\Project**

Project folders are named in this format: **[WA #]-Project_Name**

Each project folder contains these sub-folders:

- The *_Shortcuts* sub-folder is used to store all data shortcuts for the entire project. This allows all team members to easily reference project data from a central location.
- The *01-PERC* sub-folder is used for storing preliminary-engineering drawings (PERC stands for Preliminary Engineering Resource Composite).
- The *02-Survey* sub-folder is used to store survey drawings. The *A-Plot_Files* sub-folder is used to store the Record of Survey sheet set (title block) drawings.
- The *03-Base_Map* sub-folder is used to store research information and the base map drawing with the survey drawing overlayed (XREF'd) under it.
- The *04-Design* sub-folder is used to store design drawings. Plan and detail drawings are stored in the *B-XREFs* sub-folder while sheet set (title block) drawings are stored in the *A-Plot_Files* sub-folder.
- The *05-Record_Drawings* sub-folder is used to store redlined as-built drawings.



XREFs

External Referencing, or XREF'ing, has been a standard procedure for concurrent engineering for a long time. The survey and base map drawings should be XREF'd into design drawings as a basis for the design. Every design discipline (plan view) should be a separate XREF drawing. Sheet drawings (paper-space) should XREF the survey, base map, and design drawings into model-space and display all or a portion of the composite plan view with viewports.

The XREF type should always be "Overlay".

XREF Aliases

In the External References (XREF) palette you can edit the "Reference Name" (in the "Details" section of the palette) for each XREF. This "Reference Name" will be the layer prefix (followed by the | symbol) for the XREF layers. This allows users to easily filter layers based on individual XREF names (or aliases) using Layer Filters and Layer States.

- Survey: X-TOPO
- Right-of-Way: X-RWAY
- Base Map: X-BASE
- Water Design: X-WATR
- Drainage Design: X-STRM
- Sewer Design: X-SSWR
- Electrical Instrumentation Design: X-INST
- Landscape Design: X-VEGE
- Paving Design: X-ROAD
- Channelization Design: X-CHAN
- Traffic Signals Design: X-SIGS
- Structural Design: X-STRU
- Details: X-DETL
- TESC: X-TESC
- Removal: X-DEMO
- Protection: X-PROT
- Irrigation: X-IRRG
- Views: X-VIEW
- Miscellaneous: X-MISC
- Record Drawing: X-RDWG
- SCL Power Design: X-POWR
- Grading: X-GRAD
- Site: X-SITE

XREF File Naming Convention

- Survey: [WA #]-X-TOPO-[optional_description].dwg
- Right-of-Way: [WA #]-X-RWAY-[optional_description].dwg
- Base Map: [WA #]-X-BASE-[optional_description].dwg
- Water Design: [WA #]-X-WATR-[optional_description].dwg
- Drainage Design: [WA #]-X-STRM-[optional_description].dwg
- Sewer Design: [WA #]-X-SSWR-[optional_description].dwg
- Electrical Instrumentation Design: [WA #]-X-INST-[optional_description].dwg
- Landscape Design: [WA #]-X-VEGE-[optional_description].dwg
- Paving Design: [WA #]-X-ROAD-[optional_description].dwg
- Channelization Design: [WA #]-X-CHAN-[optional_description].dwg
- Traffic Signals Design: [WA #]-X-SIGS-[optional_description].dwg
- Structural Design: [WA #]-X-STRU-[optional_description].dwg
- Details: [WA #]-X-DETL-[optional_description].dwg
- TESC: [WA #]-X-TESC-[optional_description].dwg
- Removal: [WA #]-X-DEMO-[optional_description].dwg
- Protection: [WA #]-X-PROT-[optional_description].dwg
- Irrigation: [WA #]-X-IRRG-[optional_description].dwg
- Views: [WA #]-X-VIEW-[optional_description].dwg
- Miscellaneous: [WA #]-X-MISC-[optional_description].dwg
- Record Drawing: [WA #]-X-RDWG-[optional_description].dwg
- SCL Power Design: [WA #]-X-POWR-[optional_description].dwg
- Grading: [WA #]-X-GRAD-[optional_description].dwg
- Site: [WA #]-X-SITE-[optional_description].dwg

Data Shortcuts and Data Referencing

Civil 3D has a tool called *Data Shortcuts* which allows you to share project data. Here is a list of the types of data that can be shared using Data Shortcuts:

- Surfaces
- Profiles
- View Frame Groups
- Pipe Networks
- Alignments

Definitions:

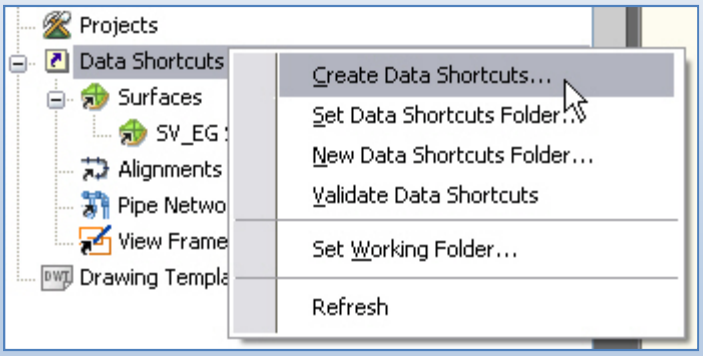
- **Create Data Shortcut:** Share the Civil 3D data with others (publish XML to *_Shortcuts* folder).
- **Create Reference:** Bring shared Civil 3D data into your drawing.

One person can create a data shortcut of data they have created and another person can create a reference to that shared data.

For example, the survey group will *create data shortcuts* of alignments and existing ground surfaces. The base map group will XREF the survey map, freeze the alignment and surface layers, *create references* of the alignments and existing ground surfaces and *create data shortcuts* of pipe networks. The design group will XREF the survey map and base map, freeze the alignment, surface, and pipe layers, and *create data references* of the alignments, existing ground surfaces, and pipe networks to use as the basis for the design.

Tip: Create Data Shortcuts in Civil 3D 2009

1. In the Prospector tab of Toolspace (command: SHOWTS), right-click on “Data Shortcuts” and click “Set Working Folder…” Set it to **P:\Project**
2. In the Prospector tab of Toolspace, right-click on “Data Shortcuts” and click “Set Data Shortcuts Folder…” Select your project name.
3. In the Prospector tab of Toolspace, right-click on “Data Shortcuts” and click “Create Data Shortcuts…” Select the items for which you want to create shortcuts and hit OK.



Sheet Set Manager

AutoCAD and Civil 3D have a powerful sheet creation/management tool called Sheet Set Manager (SSM). It leverages the power of fields to make cross-referencing easy and it allows you to print (based on a predefined page setup) selected or all sheets with a simple right-click.

View Naming

Because we are using Sheet Set Manager, it is crucial to create named views (command: VIEW) in XREF drawings. View names should reflect the exact title of the drawing view or detail. For example, an "air valve vault detail" view should be named, AIR VALVE VAULT DETAIL. AutoCAD's view manager, however, will not allow certain "special characters" in named views (such as <>/\'":;?*|,=`) but there is a workaround. Here are %% codes to use in place of these special characters:

%%60 = <	%%39 = '	%%44 = ,
%%62 = >	%%34 = "	%%63 = ?
%%47 = /	%%58 = :	%%42 = *
%%92 = \	%%59 = ;	%%61 = =

View Title Example:

Desired Title: 24" BFV DETAIL
View Name: 24%%34 BFV DETAIL

Sheet File-Naming Convention

- Cover: # [WA #]-P-Cover-[description].dwg
- Site: # [WA #]-P-Site-[description].dwg
- Notes: # [WA #]-P-Notes-[description].dwg
- Water: # [WA #]-P-WATR-[description].dwg
- Drainage: # [WA #]-P-STRM-[description].dwg
- Sewer: # [WA #]-P-SSWR-[description].dwg
- Electrical: # [WA #]-P-INST-[description].dwg
- Landscape: # [WA #]-P-VEGE-[description].dwg
- Paving: # [WA #]-P-ROAD-[description].dwg
- Channelization: # [WA #]-P-CHAN-[description].dwg
- Traffic Signals: # [WA #]-P-SIGS-[description].dwg
- Structural: # [WA #]-P-STRU-[description].dwg
- Details: # [WA #]-P-DETL-[description].dwg
- Right-of-Way: # [WA #]-P-RWAY-[description].dwg
- TESC: # [WA #]-P-TESC-[description].dwg
- Removal: # [WA #]-P-DEMO-[description].dwg
- Protection: # [WA #]-P-PROT-[description].dwg
- Irrigation: # [WA #]-P-IRRG-[description].dwg

- Misc: # [WA #]-P-MISC-[description].dwg
- Record Drawing: # [WA #]-P-RDWG-[description].dwg
- SCL Power: # [WA #]-P-POWR-[description].dwg

See Appendix 5 for more information on working with Sheet Set Manager.

Paperless Plotting

Creating DWFs and PDFs is an important part of our work process. Not only does it save paper, but it also allows us to electronically share drawings with people who do not have Civil 3D. The DWF format is especially powerful because it can be marked-up electronically using Autodesk Design Review. Download it for free at: http://www.autodesk.com/designreview-download

Collated DWF/PDF File-Naming Convention:

- DWF: [WA #]-[project_name]-[milestone].dwf
- PDF: [WA #]-[project_name]-[milestone].pdf

(i.e. C123456-Morse_Lake_Pump_Plant-100%.dwf)

See Appendix 6 for more information on working with Autodesk Design Review.

Section 4: Layers

The layer name format is organized as a hierarchy. This arrangement allows users to select from a number of options for naming layers according to the level of detailed information desired. Layer names consist of distinct data fields separated from one another by dashes. A detailed list of abbreviations, or field codes, is prescribed to define the content of layers. Most field codes are mnemonic English abbreviations of construction terminology that are easy to remember.

The layer name format, showing the Discipline Designator, the Major Group, two Minor Groups, and the Status fields looks like this:

C	U	-	S	S	W	R	-	P	I	P	E	-	L	R	G	E	-	1

Here are lists of common layer fields (not all fields are represented here):

Layer Fields: Discipline Designators

Designator:	Description:
V	**Survey**
VA	Aerial Survey
VF	Construction Field Survey
VJ	Calculated Survey
R	**Base Map**
RE	Base Map Electrical Instrumentation
RP	Base Map Paving
RU	Base Map Utilities
C	**Civil**
CU	Civil Utilities
CP	Civil Paving
CG	Civil Grading
EI	**Electrical Instrumentation**
L	**Landscaping**

Layer Fields: Major Group

Abbrev:	Description:
ALIN	Alignments
ANNO	Sheet annotation
BLDG	Buildings and primary structures
BLIN	Baseline
BNDY	Political Boundaries
BORE	Test borings
BRDG	Bridges
BRKL	Break / fault lines
CABL	Cable
CHAN	Channelization
COMM	Communications
CTRL	Control points

Abbrev:	Description:
DATA	Data outlets
DETL	Details
DIAG	Diagrams
DRIV	Driveways
DTCH	Ditches or washes
EROS	TESC (temporary erosion and sediment control)
ESMT	Easements
FNDN	Foundations
FENC	Fencing
FIRE	Fire protection system
FLHA	Flood hazard area
FUEL	Fuel gas
GRND	Ground systems
INTR	Interference
IRRG	Irrigation
LITE	Light poles
LOCN	Limits of construction
MATL	Material section
NODE	Point
NGAS	Natural gas
PIPE	Pipes
PLNT	Plant and landscape material
POND	Ponds
POWR	Power (Seattle City Light)
PRKG	Parking
PROF	Profiles
PROP	Property
PVMT	Pavement (non-roadway paving, i.e. conc pads)
RAIL	Railway
RDWG	Record Drawing (as-built redlines)
RIVR	River
ROAD	Roadways
RRAP	Riprap
RWAY	Right-of-Way
SCOM	Combined sewers
SECT	Sections
SGHT	Sight distance
SOIL	Soils
SURV	Survey
SSWR	Sanitary sewer
STEM	Steam
STRM	Storm sewer
SWLK	Sidewalks
TINN	Triangulated irregular network
TOPO	Topography
TRAL	Trails or paths
VIEW	Viewports

Abbrev:	Description:
WALL	Walls
WATR	Water supply systems
WETL	Wetlands
WTZN	Water pressure zone

Layer Fields: Minor Group

Abbrev:	Description:
025Y	Flood: 25 year mark
050Y	Flood: 50 year mark
100Y	Flood: 100 year mark
200Y	Flood: 200 year mark
ACCS	Easements: Access (pedestrian only)
ANNO	Annotation
ASPH	Pavement: Asphalt
ASSM	Corridors: Assemblies
BACK	Pavement: Back
BARS	Sheets: Bar scales
BNDY	Topography: Boundaries (surface boundaries)
BOTD	Ditches: Bottom of ditch
BRNG	Annotation, Alignments: Bearing and distance (survey coordinates)
BUFF	Wetlands: Buffers
CATV	Utilities: Cable television
CIPR	TESC: Culvert inlet protection
CNTE	TESC: Drainage divides
CNTR	All: Center lines
CON1	Details: Thick construction lines
CON2	Details: Thin construction lines
CONC	Pavement: Concrete
CONS	Easements: Conservation
CORR	Corridors
CSTG	Easements: Construction / grading
CTLJ	Walls: Control joints
CURB	Pavement: Curbs
DAYL	Grading: Daylight lines
DECK	Buildings: Outdoor decks (no roof)
DEPR	Topography: Depression (depression contours)
DRAN	Grading: Drainage slope
DVDK	TESC: Diversion dike
EGND	Profiles: Existing ground
ELEC	Utilities: Electrical
EQPM	Utilities: Equipment (pumps, motors, etc.)
EWAT	Topography: Edge of water
FACE	Pavement: Face (front)
FALT	Topography: Fault / break lines
FDPL	Flood plain
FEAT	Grading: Feature lines
FGND	Profiles: Finish ground
FIXT	All: Fixtures (wheel stops, parking meters, etc.)
FLNE	Paint: Fire lane
FRME	Sheets: Frame
GRAL	Fencing: Guard rails
GRID	Profiles: Profile grid

Abbrev:	Description:
GRVL	Pavement: Gravel
HID1	Details: Thick hidden lines
HID2	Details: Thin hidden lines
HTCH	All: Hatch
HYDR	Water: Fire hydrants
INEG	Easements: Ingress / egress (vehicles only)
INPR	TESC: Inlet protection
INST	Utilities: Instrumentation (meters, valves, etc.)
INTR	Misc: Interference
KEYN	Sheets: Keynotes
LABL	Annotation: Labels
LATL	Utilities: Laterals (sewer & drainage connections)
LEGN	Sheets: Legends, symbol keys
LIDR	LIDAR Data
LINE	All: Lines (property lines, etc.)
LRGE	Utilities: Large piping (>/= 12”)
LSCP	Misc: Landscape
MAJR	All: Major lines
MATC	Sheets: Match lines
MHOL	Utilities: Maintenance holes
MINR	All: Minor lines
MRKG	All: Markings
NOTE	Sheets: Notes
NPLT	Misc: Non-plotting graphic information
NRTH	Sheets: North arrows
NSBR	Walls: Noise Barriers
OTLN	Buildings: Outline
OVHD	Buildings: Overhead (overhang)
PERM	All: Permanent
PHON	Utilities: Telephone lines
PIPE	Utilities: Pipes
POLE	Utilities: Boxes / poles
POST	Fencing: Posts
PRCH	Buildings: Porch (attached, roof overhead)
PROF	Profiles
PROJ	Grading: Projection lines
RDME	Misc: Read-me layer (not plotted)
REDL	Misc: Redlines
REPL	Wetlands: Replacement
REVC	Misc: Revision clouds
REVS	Sheets: Revisions
ROAD	Pavement: Roadways
RTWL	Walls: Retaining walls
RWAY	Easements: Right-of-way (public access)
SAMP	Sections: Sample lines
SBCK	Property: Setback lines
SCHD	Sheets: Schedules

Abbrev:	Description:
SECT	Sections
SHEA	Walls: Structural bering or shear walls
SIGN	All: Signs
SILT	TESC: Silt fence
SLOP	Grading: Slope patterns
SMAL	Utilities: Small piping (< 12”)
SPOT	Topography: Spot elevations
SSLT	TESC: Super silt fence
STAN	Alignments: Stationing
STEL	Fencing: Steel
STRC	Utilities: Structures
STRP	Paint: Striping
SUBA	Corridors: Sub-assemblies
SUBT	Sheets: Sub-titles
SURF	Surface
SWAY	Utilities: Spillway
SWMT	Utilities: Storm water management
SYMB	Sheets: Reference symbols
TABL	Sheets: Tables
TANK	Utilities: Storage tanks
TEMP	All: Temporary
TICK	Paint: Dashed paint lines or tick marks
TITL	Sheets: Titles
TOEB	Topography: Toe of bank
TOPB	Topography: Top of bank
TOPD	Ditches: Top of ditch
TPIT	Topography: Test pits
TRAL	Pavement: Trail or path (public access)
TTLB	Sheets: Border and title blocks
UNDR	Utilities: Underground
UPVD	Pavement: Unpaved surface
UTIL	Utilities
VIEW	View frames/boxes
WELL	Utilities: Wells
WHIT	Paint: White paint lines
WOOD	Fencing: Wood
YELO	Paint: Yellow paint lines
CITY	City Boundaries
CNTY	County Boundaries
NATL	National Boundaries
PLSS	Public Land Survey System

Layer Fields: Status

Phase #:	Description:
1	Phase 1
2	Phase 2
3	Phase 3
4	Phase 4
5	Phase 5
…	Etc.

Common Layer Names

The SPU/SDoT templates come pre-loaded with a few standard layers by default. Below is a list of some common layer names (not all layer names are represented here).

[] is to be replaced with one of these Discipline Designators: **V**, **R**, **C**, or **L**

Layer Name	Layer Description	Applies To
[]-ALIN	**Alignments**	Civil 3D Object
[]-ALIN-ANNO	stationing	Civil 3D Object
[]-ALIN-TABL	tables	Civil 3D Object
[]-ANNO	**Sheet Annotation (to be used on sheet/title block drawings)**	Annotation
[]-ANNO-BARS	Bar Scales	Linework
[]-ANNO-BRNG	Bearings and distance labels (survey coordinates)	Annotation
[]-ANNO-GRID	Profile Grid	Linework
[]-ANNO-GRID-MAJR	Profile Grid - Major	Linework
[]-ANNO-GRID-MINR	Profile Grid - Minor	Linework
[]-ANNO-IDEN	Identification tags	Annotation
[]-ANNO-KEYN	Keynotes	Annotation
[]-ANNO-LABL	Labels	Annotation
[]-ANNO-LEGN	Legends, symbol keys	Annotation
[]-ANNO-MARK	Markers, break marks	Annotation
[]-ANNO-MATC	Match lines	Annotation
[]-ANNO-NOTE	Notes	Annotation
[]-ANNO-NPLT	Non-plotting graphic information	Annotation
[]-ANNO-NRTH	North Arrows	Linework
[]-ANNO-RDME	Read-me layer (not plotted)	Annotation
[]-ANNO-REVC	Revision clouds	Annotation
[]-ANNO-REVS	Revisions	Annotation
[]-ANNO-SCHD	Schedules	Annotation
[]-ANNO-SUBT	Sub-title	Annotation
[]-ANNO-SYMB	Reference symbols	Annotation
[]-ANNO-TABL	Data tables	Annotation
[]-ANNO-TEXT	Text, dimensions, leaders, etc.	Annotation
[]-ANNO-TITL	Drawing or detail titles	Annotation
[]-ANNO-TTLB	Border and title block	Annotation
[]-BLDG	**Buildings and primary structures**	Civil 3D Object
[]-BLDG-ANNO	Text, dimensions, leaders, etc.	Annotation
[]-BLDG-DECK	Outdoor decks (no roof)	Linework
[]-BLDG-OTLN	Outline	Linework
[]-BLDG-OVHD	Overhead (overhang)	Linework
[]-BLDG-PRCH	Porch (attached, roof overhead)	Linework
[]-BLIN	**Baseline**	Civil 3D Object

Layer Name	Layer Description	Applies To
[]-BLIN-ANNO	Text, dimensions, leaders, etc.	Annotation
[]-BLIN-STAN-ANNO	Stationing	Annotation
[]-BRKL	**Break / fault lines**	Linework
[]-BORE	**Test borings**	Civil 3D Object
[]-BORE-ANNO	Text, dimensions, leaders, etc.	Annotation
[]-BNDY	**Political Boundaries**	Civil 3D Object
[]-BNDY-ANNO	text, dimensions, leaders, etc.	Annotation
[]-BNDY-CITY	City boundaries	Linework
[]-BNDY-CNTY	County boundaries	Linework
[]-BNDY-ZONE	Political zoning	Linework
[]-BNDY-NATL	National boundaries	Linework
[]-BNDY-PLSS	Public Land Survey System	Linework
[]-DETL	**Details**	Civil 3D Object
[]-DETL-ANNO	text, dimensions, leaders, etc.	Annotation
[]-DETL-ANNO-SUBT	sub-title	Annotation
[]-DETL-ANNO-TITL	title	Annotation
[]-DETL-CNTR	center lines	Linework
[]-DETL-CON1	continuous lines - thick	Linework
[]-DETL-CON2	continuous lines - thin	Linework
[]-DETL-HID1	hidden lines - thick	Linework
[]-DETL-HID2	hidden lines - thin	Linework
[]-DETL-HTCH	hatching	Hatch
[]-DRIV	**Driveways**	Civil 3D Object
[]-DRIV-ANNO	Text, dimensions, leaders, etc.	Annotation
[]-DRIV-ASPH	asphalt surface	Hatch
[]-DRIV-CNTR	centerline	Linework
[]-DRIV-CONC	concrete surface	Hatch
[]-DRIV-CURB	curb	Linework
[]-DRIV-CURB-BACK	curb: back	Linework
[]-DRIV-CURB-FACE	curb: face	Linework
[]-DRIV-FLNE	fire lane	Linework
[]-DRIV-FLNE-MRKG	fire lane: pavement markings	Linework
[]-DRIV-FLNE-SIGN	fire lane: signs	Linework
[]-DRIV-GRVL	gravel surface	Hatch
[]-DRIV-MRKG	pavement markings	Linework
[]-DRIV-SIGN	signs	Linework
[]-DRIV-UPVD	unpaved surface	Hatch
[]-DRIV-WHIT	white paint	Linework
[]-DRIV-WHIT-TICK	white paint: tick marks	Linework
[]-DRIV-YELO	yellow paint	Linework
[]-DRIV-YELO-TICK	yellow paint: tick marks	Linework

Layer Name	Layer Description	Applies To
[]-DTCH	**Ditches or washes**	Civil 3D Object
[]-DTCH-ANNO	Text, dimensions, leaders, etc.	Annotation
[]-DTCH-BOTD	bottom	Linework
[]-DTCH-CNTR	centerline	Linework
[]-DTCH-EWAT	edge of water	Linework
[]-DTCH-TOPD	top	Linework
[]-EROS	**Erosion and sediment control**	Civil 3D Object
[]-EROS-ANNO	Text, dimensions, leaders, etc.	Annotation
[]-EROS-CIPR	culvert inlet protection	Hatch
[]-EROS-CNTE	construction entrance	Linework
[]-EROS-DDIV	drainage divides	Linework
[]-EROS-DVDK	diversion dike	Linework
[]-EROS-INPR	inlet protection	Hatch
[]-EROS-SILT	silt fence	Linework
[]-EROS-SSLT	super silt fence	Linework
[]-ESMT	**Easements**	Civil 3D Object
[]-ESMT-ACCS	access (pedestrian only; private access)	Linework
[]-ESMT-ANNO	Text, dimensions, leaders, etc.	Annotation
[]-ESMT-CATV	utility - cable television	Linework
[]-ESMT-CONS	conservation	Linework
[]-ESMT-CSTG	construction / grading	Linework
[]-ESMT-ELEC	utility - electrical	Linework
[]-ESMT-FDPL	flood plain	Linework
[]-ESMT-INEG	ingress / egress (vehicles; private access)	Linework
[]-ESMT-LSCP	landscape	Linework
[]-ESMT-NGAS	natural gas line	Linework
[]-ESMT-PHON	telephone line	Linework
[]-ESMT-ROAD	roadway	Linework
[]-ESMT-ROAD-PERM	roadway: permanent	Linework
[]-ESMT-ROAD-TEMP	roadway: temporary	Linework
[]-ESMT-RWAY	right-of-way (public access)	Linework
[]-ESMT-SGHT	sight distance	Linework
[]-ESMT-SSWR	sanitary sewer	Linework
[]-ESMT-STRM	storm sewer	Linework
[]-ESMT-SWMT	storm water management	Linework
[]-ESMT-TRAL	trail or path (public access)	Linework
[]-ESMT-UTIL	utilities	Linework
[]-ESMT-WATR	water supply	Linework
[]-FENC	**Fences**	Civil 3D Object
[]-FENC-ANNO	Text, dimensions, leaders, etc.	Annotation
[]-FENC-GRAL	guard rail	Linework

Layer Name	Layer Description	Applies To
[]-FENC-POST	posts	Linework
[]-FENC-STEL	steel (barbed wire and/or chain link)	Linework
[]-FENC-WOOD	wood	Linework
[]-FLHA	**Flood hazard area**	Civil 3D Object
[]-FLHA-025Y	25 year mark	Linework
[]-FLHA-050Y	50 year mark	Linework
[]-FLHA-100Y	100 year mark	Linework
[]-FLHA-200Y	200 year mark	Linework
[]-FLHA-ANNO	Text, dimensions, leaders, etc.	Annotation
[]G-TOPO	**Grading**	Civil 3D Object
[]G-TOPO-CNTR	center marker	Linework
[]G-TOPO-DAYL	daylight line	Linework
[]G-TOPO-FEAT	feature lines	Civil 3D Object
[]G-TOPO-PROJ	projection line	Linework
[]G-TOPO-SLOP	slope pattern	Linework
[]G-TOPO-CORR	**Corridors**	Civil 3D Object
[]G-TOPO-CORR-ASSM	assembly	Civil 3D Object
[]G-TOPO-CORR-SUBA	subassembly	Civil 3D Object
[]G-TOPO-CORR-FEAT	feature lines	Civil 3D Object
[]G-TOPO-CORR-SECT	sections	Civil 3D Object
[]-INTR	**Interference**	Civil 3D Object
[]-LOCN	**Limits of construction**	Linework
[]-LOCN-ANNO	Text, dimensions, leaders, etc.	Annotation
[]-MATL	**Material Section**	Civil 3D Object
[]-MATL-TABL	tables	Civil 3D Object
[]-POND	**Ponds**	Civil 3D Object
[]-POND-ANNO	Text, dimensions, leaders, etc.	Annotation
[]-POND-EDGE	edge	Linework
[]-POND-SWAY	spillway	Linework
[]-POND-TOEB	toe of bank	Linework
[]-POND-TOPB	top of bank	Linework
[]P-PRKG	**Parking**	Civil 3D Object
[]P-PRKG-ANNO	Text, dimensions, leaders, etc.	Annotation
[]P-PRKG-ASPH	asphalt surface	Hatch
[]P-PRKG-CONC	concrete surface	Hatch
[]P-PRKG-CURB	curb	Linework
[]P-PRKG-CURB-BACK	curb: back	Linework
[]P-PRKG-CURB-FACE	curb: face	Linework
[]P-PRKG-FIXT	fixtures (wheel stops, parking meters, etc.)	Linework
[]P-PRKG-FLNE	fire lane	Linework
[]P-PRKG-FLNE-MRKG	fire lane: pavement markings	Linework

Layer Name	Layer Description	Applies To
[]P-PRKG-FLNE-SIGN	fire lane: signage	Linework
[]P-PRKG-GRVL	gravel surface	Hatch
[]P-PRKG-MRKG	pavement markings	Linework
[]P-PRKG-SIGN	signs	Linework
[]P-PRKG-STRP	striping	Linework
[]P-PRKG-WHIT	white paint	Linework
[]P-PRKG-WHIT-TICK	white paint: tick marks	Linework
[]P-PRKG-YELO	yellow paint	Linework
[]P-PRKG-YELO-TICK	yellow paint: tick marks	Linework
[]P-ROAD	**Roadways**	Civil 3D Object
[]P-ROAD-ANNO	Text, dimensions, leaders, etc.	Annotation
[]P-ROAD-ASPH	asphalt surface	Hatch
[]P-ROAD-CNTR	centerline	Linework
[]P-ROAD-CONC	concrete surface	Hatch
[]P-ROAD-CURB	curb	Linework
[]P-ROAD-CURB-BACK	curb: back	Linework
[]P-ROAD-CURB-FACE	curb: face	Linework
[]P-ROAD-FLNE	fire lane	Linework
[]P-ROAD-FLNE-MRKG	fire lane: pavement markings	Linework
[]P-ROAD-FLNE-SIGN	fire lane: signs	Linework
[]P-ROAD-GRVL	gravel surface	Hatch
[]P-ROAD-MRKG	pavement markings	Linework
[]P-ROAD-PROF	profile	Linework
[]P-ROAD-SIGN	signs	Linework
[]P-ROAD-STAN	stationing	Linework
[]P-ROAD-UPVD	unpaved surface	Hatch
[]P-ROAD-WHIT	white paint	Linework
[]P-ROAD-WHIT-TICK	white paint: tick marks	Linework
[]P-ROAD-YELO	yellow paint	Linework
[]P-ROAD-YELO-TICK	yellow paint: tick marks	Linework
[]-PROF	**Profiles**	Civil 3D Object
[]-PROF-ANNO	annotation	Annotation
[]-PROF-EGND	existing ground	Linework
[]-PROF-FGND	finish grade	Linework
[]-PROF-VIEW	profile views	Civil 3D Object
[]-PROF-VIEW-ANNO	profile view annotation	Annotation
[]-PROF-VIEW-MAJR	profile view major grid lines	Linework
[]-PROF-VIEW-MINR	profile view minor grid lines	Linework
[]-PROP	**Property**	Civil 3D Object
[]-PROP-ANNO	Text, dimensions, leaders, etc.	Annotation
[]-PROP-LINE	property lines, survey benchmarks, property corners	Linework

Layer Name	Layer Description	Applies To
[]-PROP-SBCK	setback lines	Linework
[]-PROP-DONA	Legal-donation land claim	Linework
[]-PROP-ORDI	Property boundary-legal ordinance	Linework
[]-PROP-QTRS	Property boundary-quarter section	Linework
[]-PROP-RSRV	Property boundary-reserve	Linework
[]-PROP-SECT	Property boundary-section boundary	Linework
[]-PROP-SUBD	Property boundary-subdivision (interior) lines	Linework
[]-PROP-SXTS	Property boundary-sixteenth section	Linework
[]-PROP-VACA	Property boundary-Legal vacation	Linework
[]-PROP-TABL	tables	Linework
[]P-SGHT	**Sight distance**	Civil 3D Object
[]P-SGHT-ANNO	Text, dimensions, leaders, etc.	Annotation
[]P-SGHT-PROF	profile	Linework
[]P-SWLK	**Sidewalks**	Civil 3D Object
[]P-SWLK-ANNO	Text, dimensions, leaders, etc.	Annotation
[]P-SWLK-ASPH	asphalt	Hatch
[]P-SWLK-CONC	concrete	Hatch
[]P-TRAL	**Trails or paths**	Linework
[]P-TRAL-ANNO	Text, dimensions, leaders, etc.	Annotation
[]P-TRAL-ASPH	asphalt surface	Hatch
[]P-TRAL-CONC	concrete surface	Hatch
[]P-TRAL-GRVL	gravel surface	Hatch
[]P-TRAL-MRKG	pavement markings	Linework
[]P-TRAL-SIGN	signs	Linework
[]P-TRAL-UPVD	unpaved surface	Hatch
[]-PVMT	**Pavement (non-roadway paving, i.e. conc pads)**	Civil 3D Object
[]-PVMT-ANNO	Text, dimensions, leaders, etc.	Annotation
[]-PVMT-ASPH	asphalt surface	Hatch
[]-PVMT-CONC	concrete surface	Hatch
[]-PVMT-GRVL	gravel surface	Hatch
[]-RIVR	**River**	Civil 3D Object
[]-RIVR-ANNO	Text, dimensions, leaders, etc.	Annotation
[]-RIVR-BOTM	bottom	Linework
[]-RIVR-CNTR	centerline	Linework
[]-RIVR-EDGE	edge	Linework
[]-RIVR-TOPB	top of bank	Linework
[]-RRAP	**Riprap**	Civil 3D Object
[]-RRAP-ANNO	Text, dimensions, leaders, etc.	Annotation
[]-RWAY	**Right-of-way**	Linework
[]-RWAY-CNTR	centerline	Linework
[]-RWAY-CTLA	controlled access	Linework

Layer Name	Layer Description	Applies To
[]-RWAY-LINE	lines	Linework
[]-RWAY-LMTA	limited access	Linework
[]-RWAY-MRKR	marker	Linework
[]-RWAY-STAN	stationing	Annotation
[]-SECT	**Sections**	Civil 3D Object
[]-SECT-ANNO	annotation	Annotation
[]-SECT-SAMP	sample lines	Civil 3D Object
[]-SECT-SAMP-ANNO	annotation	Annotation
[]-SECT-SAMP-LINE	lines	Linework
[]-SECT-SAMP-VERT	vertices	Linework
[]-SECT-VIEW	section views	Civil 3D Object
[]-SECT-VIEW-ANNO	section view annotation	Annotation
[]-SECT-VIEW-MAJR	section view major grid lines	Linework
[]-SECT-VIEW-MINR	section view minor grid lines	Linework
[]-SECT-VIEW-TABL	tables	Civil 3D Object
[]-SOIL	**Soils**	Hatch
[]-SOIL-ANNO	Text, dimensions, leaders, etc.	Annotation
[]-TINN	**Triangulated irregular network**	Civil 3D Object
[]-TINN-ANNO	Text, dimensions, leaders, etc.	Annotation
[]-TINN-BNDY	boundary	Linework
[]-TINN-FALT	fault / break lines	Linework
[]-TINN-VIEW	triangulation	Linework
[]-TOPO	**Topography**	Civil 3D Object
[]-TOPO-ANNO	Text, dimensions, leaders, etc.	Annotation
[]-TOPO-BORE	test borings	Annotation
[]-TOPO-DEPR	depression contours	Linework
[]-TOPO-LIDR	Topography from LIDAR data	Civil 3D Object
[]-TOPO-MAJR	major contours	Linework
[]-TOPO-MAJR-ANNO	major contour labels	Annotation
[]-TOPO-MINR	minor contours	Linework
[]-TOPO-MINR-ANNO	minor contour labels	Annotation
[]-TOPO-SPOT	spot elevations	Annotation
[]-TOPO-TABL	tables	Civil 3D Object
[]-TOPO-TPIT	test pits	Linework
[]U-COMM	**Communications**	Civil 3D Object
[]U-COMM-ANNO	Text, dimensions, leaders, etc.	Annotation
[]U-COMM-OVHD	Overhead lines	Linework
[]U-COMM-POLE	Box / pole	Linework
[]U-COMM-UNDR	Underground lines	Linework
[]U-FIRE	**Fire protection system**	Civil 3D Object
[]U-FIRE-ANNO	Text, dimensions, leaders, etc.	Annotation

Layer Name	Layer Description	Applies To
[]U-FIRE-HYDR	hydrants and connections	Linework
[]U-FIRE-PIPE	piping	Linework
[]U-FIRE-UNDR	underground piping	Linework
[]U-FUEL	**Fuel gas**	Civil 3D Object
[]U-FUEL-ANNO	Text, dimensions, leaders, etc.	Annotation
[]U-FUEL-EQPM	equipment (pumps, motors)	Linework
[]U-FUEL-INST	instrumentation (meters, valves, etc.)	Linework
[]U-FUEL-MHOL	manhole	Linework
[]U-FUEL-PIPE	piping	Linework
[]U-FUEL-TANK	storage tanks	Linework
[]U-FUEL-UNDR	underground piping	Linework
[]-PIPE	**Pipes**	Civil 3D Object
[]-PIPE-ANNO	annotation	Annotation
[]-PIPE-PROF	profiles	Civil 3D Object
[]-PIPE-SECT	sections	Civil 3D Object
[]-PIPE-STRC	structures	Civil 3D Object
[]-PIPE-STRC-ANNO	structure annotation	Annotation
[]-PIPE-TABL	tables	Civil 3D Object
[]U-POWR	**Power**	Civil 3D Object
[]U-POWR-ANNO	Text, dimensions, leaders, etc.	Annotation
[]U-POWR-FENC	enclosure fence	Linework
[]U-POWR-INST	instrumentation (meters, transformers)	Linework
[]U-POWR-MHOL	manhole	Linework
[]U-POWR-OVHD	overhead lines	Linework
[]U-POWR-POLE	box / pole	Linework
[]U-POWR-STRC	structures	Linework
[]U-POWR-UNDR	underground lines	Linework
[]U-SCOM	**Combined sewer**	Civil 3D Object
[]U-SCOM-ANNO	Text, dimensions, leaders, etc.	Annotation
[]U-SCOM-CNTR	centerline	Linework
[]U-SCOM-HTCH	hatching	Hatch
[]U-SCOM-LATL	storm drain connection	Linework
[]U-SCOM-MHOL	manhole casting	Linework
[]U-SCOM-PIPE-LRGE	piping: >/= 12"	Linework
[]U-SCOM-PIPE-SMAL	piping: < 12"	Linework
[]U-SCOM-STRC	structures	Linework
[]U-SSWR	**Sanitary sewer**	Civil 3D Object
[]U-SSWR-ANNO	Text, dimensions, leaders, etc.	Annotation
[]U-SSWR-CNTR	centerline	Linework
[]U-SSWR-HTCH	hatching	Hatch
[]U-SSWR-LATL	lateral line	Linework

Layer Name	Layer Description	Applies To
[]U-SSWR-MHOL	manhole casting	Linework
[]U-SSWR-PIPE-LRGE	piping: >/= 12"	Linework
[]U-SSWR-PIPE-SMAL	piping: < 12"	Linework
[]U-SSWR-PROF	profile	Civil 3D Object
[]U-SSWR-STAN	stationing	Annotation
[]U-SSWR-STRC	structures	Linework
[]U-STRM	**Storm sewer**	Civil 3D Object
[]U-STRM-ANNO	Text, dimensions, leaders, etc.	Annotation
[]U-STRM-CNTR	centerline	Linework
[]U-STRM-HTCH	hatching	Hatch
[]U-STRM-LATL	storm drain connection	Linework
[]U-STRM-MHOL	manhole casting	Linework
[]U-STRM-PIPE-LRGE	piping: >/= 12"	Linework
[]U-STRM-PIPE-SMAL	piping: < 12"	Linework
[]U-STRM-PROF	profile	Civil 3D Object
[]U-STRM-STAN	stationing	Annotation
[]U-STRM-STRC	structures	Linework
[]U-WATR	**Water supply systems**	Civil 3D Object
[]U-WATR-ANNO	Text, dimensions, leaders, etc.	Annotation
[]U-WATR-CNTR	centerline	Linework
[]U-WATR-HTCH	hatching	Hatch
[]U-WATR-INST	instrumentation (meters, valves, etc.)	Linework
[]U-WATR-PIPE	piping	Linework
[]U-WATR-STAN	stationing	Annotation
[]U-WATR-WELL	well	Linework
[]-VIEW	**Sheet Views**	Civil 3D Object
[]-VIEW-ANNO	annotation	Annotation
[]-VIEW-FRME	view frame	Linework
[]-WALL	**Walls**	Civil 3D Object
[]-WALL-ANNO	Text, dimensions, leaders, etc.	Annotation
[]-WALL-CTLJ	control joints	Linework
[]-WALL-NSBR	noise barrier	Linework
[]-WALL-RTWL	retaining	Linework
[]-WALL-SHEA	structural bearing or shear walls	Linework
[]-WETL	**Wetlands**	Civil 3D Object
[]-WETL-ANNO	Text, dimensions, leaders, etc.	Annotation
[]-WETL-BUFF	buffer	Linework
[]-WETL-REPL	replacement	Linework
[]-WTZN	**Water pressure zone**	Linework
[]-IRRG	**Irrigation**	Linework
[]-IRRG-ANNO	text, dimensions, leaders, etc.	Annotation

Layer Name	Layer Description	Applies To
[]-IRRG-COVR	coverage	Linework
[]-IRRG-DRIP	drip irrigation tubing	Linework
[]-IRRG-LTRL	lateral pipe	Linework
[]-IRRG-MAIN	mainline	Linework
[]-IRRG-PIPE	piping	Linework
[]-IRRG-SLVE	pipe sleeve	Linework
[]-IRRG-SPKL	sprinklers (rotors, heads)	Linework
[]-IRRG-EQPM	equipment (pumps, valves, and controllers)	Linework
[]-IRRG-VALV	valves	Linework
[]-PLNT	**Plant and landscape material**	Linework
[]-PLNT-ANNO	text, dimensions, leaders, etc.	Annotation
[]-PLNT-REMV	material to be removed	Linework
[]-PLNT-BEDS	perennial and annual beds	Linework
[]-PLNT-BUSH	bushes and shrubs	Linework
[]-PLNT-CONI	coniferous trees	Linework
[]-PLNT-DECI	deciduous trees	Linework
[]-PLNT-GRND	ground covers	Linework
[]-PLNT-PALM	palm trees	Linework
[]-PLNT-REMN	material to remain	Linework
[]-PLNT-SHRB	shrub symbols	Linework
[]-PLNT-TREE	trees	Linework
[]-PLNT-PLTS	planting plants	Linework
[]-PLNT-VINE	vines	Linework
[]-PLNT-CTNR	container or planter	Linework
[]-PLNT-EDGR	planting bed edger	Linework
[]-PLNT-SEED	seeding areas	Linework
[]-PLNT-SHAD	shadow area	Linework
[]-PLNT-TURF	lawn areas	Linework
EI-CABL	**Electrical - Cable**	Linework
EI-CABL-FIBR	Electrical - Fiber Optic	Linework
EI-CTRL-WIRE	Electrical - Wiring -Analog Signals	Linework
EI-DATA-BUSS-ENET	Electrical - Wiring -Ethernet Bus	Linework
EI-DATA-BUSS-LABL	Electrical - Bus Connection Labels	Annotation
EI-DATA-BUSS-R232	Electrical - Wiring -RS232 Bus	Linework
EI-DATA-BUSS-R485	Electrical - Wiring -RS485/422 Bus	Linework
EI-DATA-LABL	Electrical - Signal Labels/Names	Annotation
EI-DATA-WIRE	Electrical - Wiring -Digital Signals	Linework
EI-DIAG-CONN	Electrical - Connectors -All Styles	Linework
EI-DIAG-DEVC	Electrical - Hardware	Linework
EI-DIAG-DEVC-ANNO	Electrical - Associates Part/Model No	Annotation
EI-DIAG-DEVC-LABL	Electrical - Device Labels/Description	Annotation

Layer Name	Layer Description	Applies To
EI-DIAG-ENCL	Electrical - Equipment Enclosures	Linework
EI-DIAG-IDEN	Electrical - Label Device Pin/Terminal Nos	Annotation
EI-DIAG-SYMB	Electrical - Components -Symbols	Linework
EI-GRND-AC	Electrical - Wiring -AC Return	Linework
EI-GRND-DC	Electrical - Wiring -DC Power Ground	Linework
EI-GRND-REFR	Electrical - Wiring -Earth/Chassis Ground	Linework
EI-NOTE	Electrical - Electrical General Text/Notes	Annotation
EI-POWR-AC	Electrical - Wiring -AC Lines and Supplies	Linework
EI-POWR-DC	Electrical - Wiring -DC Power Supplies	Linework
RE-CABL	Existing Electrical - Cable	Linework
RE-CABL-FIBR	Existing Electrical - Fiber Optic	Linework
RE-CTRL-WIRE	Existing Electrical - Wiring -Analog Signals	Linework
RE-DATA-BUSS-ENET	Existing Electrical - Wiring -Ethernet Bus	Linework
RE-DATA-BUSS-LABL	Existing Electrical - Bus Connection Labels	Annotation
RE-DATA-BUSS-R232	Existing Electrical - Wiring -RS232 Bus	Linework
C-RDWG	**Record Drawing (as-built redlines)**	Civil 3D Object
C-RDWG-ANNO	**Record Drawing (as-built redlines)** Annotation	Annotation
C-RDWG-ANNO-SUBT	**Record Drawing (as-built redlines)** Sub-title	Annotation
C-RDWG-ANNO-TABL	**Record Drawing (as-built redlines)** Data tables	Annotation
C-RDWG-ANNO-TITL	**Record Drawing (as-built redlines)** Drawing or detail titles	Annotation
C-RDWG-DETL	**Record Drawing (as-built redlines)** Details	Linework
C-RDWG-DETL-CNTR	**Record Drawing (as-built redlines)** center lines	Linework
C-RDWG-DETL-CON1	**Record Drawing (as-built redlines)** continuous lines - thick	Linework
C-RDWG-DETL-CON2	**Record Drawing (as-built redlines)** continuous lines - thin	Linework
C-RDWG-DETL-HID1	**Record Drawing (as-built redlines)** hidden lines - thick	Linework
C-RDWG-DETL-HID2	**Record Drawing (as-built redlines)** hidden lines - thin	Linework
C-RDWG-DETL-HTCH	**Record Drawing (as-built redlines)** hatching	Hatch
C-RDWG-DRIV	**Record Drawing (as-built redlines)** Driveways	Linework
C-RDWG-DTCH	**Record Drawing (as-built redlines)** Ditches or washes	Linework
C-RDWG-FENC	**Record Drawing (as-built redlines)** Fences	Linework
C-RDWG-FENC-GRAL	**Record Drawing (as-built redlines)** guard rail	Linework
C-RDWG-FENC-POST	**Record Drawing (as-built redlines)** posts	Linework
C-RDWG-FENC-STEL	**Record Drawing (as-built redlines)** steel (barbed wire and/or chain link)	Linework
C-RDWG-FENC-WOOD	**Record Drawing (as-built redlines)** wood	Linework
C-RDWG-POND	**Record Drawing (as-built redlines)** Ponds	Linework
C-RDWG-PVMT	**Record Drawing (as-built redlines)** All Pavement	Linework
C-RDWG-PVMT-ASPH	**Record Drawing (as-built redlines)** Asphalt Pavement	Hatch
C-RDWG-PVMT-CONC	**Record Drawing (as-built redlines)** Concrete Pavement	Hatch
C-RDWG-TINN	**Record Drawing (as-built redlines)** Triangulated irregular network	Civil 3D Object
C-RDWG-TOPO	**Record Drawing (as-built redlines)** Topography	Linework

Layer Name	Layer Description	Applies To
CU-RDWG-FIRE	**Record Drawing (as-built redlines)** Fire protection system	Linework
CU-RDWG-POWR	**Record Drawing (as-built redlines)** Power	Linework
CU-RDWG-SCOM	**Record Drawing (as-built redlines)** Combined sewer	Linework
CU-RDWG-SSWR	**Record Drawing (as-built redlines)** Sanitary sewer	Linework
CU-RDWG-STRM	**Record Drawing (as-built redlines)** Storm sewer	Linework
CU-RDWG-WATR	**Record Drawing (as-built redlines)** Water supply systems	Linework
C-RDWG-WALL	**Record Drawing (as-built redlines)** Walls	Linework
C-RDWG-WETL	**Record Drawing (as-built redlines)** Wetlands	Linework
X-BASE	**XREF:** base map	XREF
X-CHAN	**XREF:** channelization	XREF
X-CLIP	**XREF:** clipping boundary	Linework
X-DEMO	**XREF:** demolition/clearing/removal	XREF
X-DETL	**XREF:** details	XREF
X-GRAD	**XREF:** grading	XREF
X-INST	**XREF:** electrical	XREF
X-IRRG	**XREF:** irrigation	XREF
X-MISC	**XREF:** misc.	XREF
X-PERC	**XREF:** Preliminary Engineering Resource Composite	XREF
X-POWR	**XREF:** SCL power design	XREF
X-PROT	**XREF:** protection	XREF
X-ROAD	**XREF:** paving	XREF
X-RWAY	**XREF:** right-of-way	XREF
X-SIGS	**XREF:** signals	XREF
X-SITE	**XREF:** site	XREF
X-SSWR	**XREF:** sewer	XREF
X-STRM	**XREF:** drainage	XREF
X-STRU	**XREF:** structural	XREF
X-TESC	**XREF:** TESC	XREF
X-TOPO	**XREF:** survey	XREF
X-VEGE	**XREF:** landscaping	XREF
X-VIEW	**XREF:** view frames	XREF
X-WATR	**XREF:** water	XREF
X-RDWG	**XREF:** record drawing	XREF

Section 5: Annotation

Most of the time annotation goes in model-space.

Text Styles

For existing and proposed drawings the standard text style (command: STYLE) name is "COS" with the font set to RomanS.

For Record Drawings the standard text style name is set to "COS-Record" with the font set to RomanS and an obliquing angle of 20 degrees.

Text Size Chart

Use the chart below as a guide to help you determine text heights in drawings with typical engineering scales.

	Drawing Scale Factor:	1*	5	10	20	50	100
	Layout (viewport) Zoom Scale:	1 XP	1/5 XP	1/10 XP	1/20 XP	1/50 XP	1/100 XP
	Scale Name:	1”=1’	1”=5’	1”=10’	1”=20’	1”=50’	1”=100’
COLOR & SIZE	RED/125 (---/existing features)	0.08	0.4	0.8	1.6	4	8
	WHITE/105 (proposed features/house #s)	0.125	0.625	1.25	2.5	6.25	12.5
	YELLOW/145 (sub-titles/side streets)	0.1875	0.9375	1.875	3.75	9.375	18.75
	GREEN (titles)	0.25	1.25	2.5	5	12.5	25
	MAGENTA/205 (---/main streets)	0.3125	1.5625	3.125	6.25	15.625	31.25

*plotted text height

Dimension Styles

Here are a few important dimension style (command: DIMSTYLE) settings:

Dimensions for Proposed Features

- Arrowheads: Closed filled
- Arrow size: 0.14
- Text style: COS
- Text height: 0.125
- Scale for dimension features: Annotative

Dimensions for Existing Features

- Arrowheads: Closed filled
- Arrow size: 0.1
- Text style: COS
- Text height: 0.08
- Scale for dimension features: Annotative

Multileader Styles

Here are a few important multileader style (command: MLEADERSTYLE) settings:

Multileaders for Proposed Features

- Arrowhead size: 0.14
- Arrowhead symbol: Closed filled
- Leader type: Straight
- Text style: COS
- Text height: 0.125
- Scale: Annotative

Multileaders for Existing Features

- Arrowhead size: 0.1
- Arrowhead symbol: Closed filled
- Leader type: Spline
- Text style: COS
- Text height: 0.08
- Scale: Annotative

We recommend using the MLEADER command instead of the QLEADER command for drawing leaders. Multileaders work much better than quick-leaders in most cases.

Annotative Text, Dimensions, & Multileaders

The COS & COS-Record text styles, dimension styles, and multileader styles should be set to "annotative" in AutoCAD Civil 3D. This means that you set the text size to the drawing scale factor of 1 (plotted text height) in model-space and allow AutoCAD Civil 3D to size and display the annotation based on the annotative scale set in the drawing or viewport.

For example, if you add text with a height of 0.08 in model-space and the annotative scale is set to 1"=20', AutoCAD Civil 3D will automatically size the text to 1.6 (viewports with a scale of 1"=20' will also display the text height as 1.6 which will then plot at 0.08 on a full-size plot).

Tip: AutoCAD Annotation Commands

- Use the command OBJECTSCALE to add/remove scales applied to individual text, dimensions, multileaders, or blocks.
- Use the command ANNOALLVISIBLE to show/hide annotative text, dimensions, multileaders, or blocks that do not have the current annotative scale. This allows you to easily show/hide text, dimensions, multileaders, or blocks through viewports based on scale.
- Use the command SCALELISTEDIT to add/edit annotative scales.

Section 6: Pen and Color Assignments

COS_CADD_Standard.ctb

Pen and Color Assignments for Contract Drawings and Base Maps:

Lineweight	Plotted Color	Color No. w/ Screening: 100	Color No. w/ Screening: 60	Color No. w/ Screening: 55
0.003	BLACK	105, 125		
0.007	BLACK	22, 65, 186		
0.01	BLACK	14, 85, 206		
0.012	BLACK	1, 226		
0.014	BLACK	7, 246		
0.014	BLACK	130		
0.02	BLACK	2, 21		145
0.024	BLACK	3, 165, 41		
0.028	BLACK	4, 61		185
0.031	BLACK	6, 81	205	
0.039	BLACK	5		
0.047	BLACK	12, 245, 121		
0.07	BLACK	53		

Record_Drawings.ctb

Pen and Color Assignments for Record Drawings:

Lineweight	Plotted Color	Color No. w/ Screening: 100
0.01	RED	38
0.012	RED	31
0.014	RED	37
0.02	RED	32
0.024	RED	33
0.028	RED	34
0.031	RED	36
0.039	RED	35

Section 7: Survey Descriptor Codes

Here is a list of survey descriptor codes:

FIELD CODE	DESCRIPTION	DATA COLLECTION POINT	LAYER	BLOCK NAME
ABUT	ABUTMENT	corner / edge	V-NODE-FNDN-ABUT	
ASPH	ASPHALT	descriptive	V-NODE-TOPO-ASPH	
AV	AIR VALVE	ctr. / size pipe	V-WATR-INST	eav
AVNT	AIR VENT	ctr. / size	V-NODE-WATR-INST	
AW	ASPHALT WALK	location	V-NODE-SWLK-ASPH	
AWNG	AWNING	corner / edge	V-NODE-BLDG-OVHD	
AZL	AZIMUTH LONG SIDE (ALIGN PNT.)	directional reference pnt. for feature	V-NODE	
BC	BRASS CAP-HORIZ AND VERT.	loc. - survey info	V-CTRL-HVPT	esvbp
BF	BOARD FENCE (SIZE)	loc. / height	V-NODE-FENC-WOOD	
BFGB	BOARD FENCE @ GB	loc. / height	V-NODE-FENC-WOOD	
BH	BOREHOLE - (GENERIC)	loc. - survey info	V-TOPO-BORE	etb
BKRK	BIKE RACK	at center of each end w/ width	V-NODE-TOPO-BIKE	
BLDG	BUILDING	At angle points, each end and common wall	V-NODE-BLDG	
BLKHD	BULKHEAD	corner / edge	V-NODE-WALL	
BLRD	BOLLARD	location	V-TOPO-POST	eblrd
BM	BENCH MARK-VERTICAL ONLY	loc. of project bench marks	V-CTRL-BMRK	esvbm
BNCH	BENCH	at center of each end w/ width	V-NODE-TOPO-BNCH	
BO	BLOW OFF	ctr. of blow off pipe	V-WATR-INST	ebo
BRDG	BRIDGE	corner / edge	V-NODE-BRDG	
BRK	BRICK	descriptive	V-NODE-ROAD-BRIK	
BRL	BARREL	CTR OF MH STRUCTURE (VS CTR LID)	V-NODE-UNDR	
BRR	JERSEY BARICADE (SIZE)	ctr. / width	V-NODE-TOPO-BARR	
BURIED	BURIED OBJECT	location	V-NODE-UNDR	
BUS	BUS SHELTER (SIZE)	ctr, size and directional ref. or multiple corners	V-NODE-BLDG-OTLN	

FIELD CODE	DESCRIPTION	DATA COLLECTION POINT	LAYER	BLOCK NAME
C	CURB (BACK OF)	top back of curb (note material desc. other than conc.)	V-NODE-ROAD-CURB	
CAB	CABINET (GENERIC)	ctr., size and (directional ref.)	V-POWR-INST	ecab
CALC	CALCULATED POINT	calc of Survey record data and/or interpolated points	VJ-NODE	
CATHP	CATHODIC PROTECTION (water)	ctr. / box size	V-NODE-WATR-INST	
CB	CATCH BASIN	ctr., size of casting	V-STRM-MHOL	ecb242a
CC	CONCRETE CULVERT (SIZE)	Invert (unless otherwise noted)	V-NODE-STRM-PIPE-RCON	
CG	CURB & GUTTER (SIZE)	width of gutter and material desc.	V-NODE-ROAD-CURB	
CHAR	ARROW- STRAIGHT	channelization- ctr symbol	V-NODE-ROAD-MRKG-ARRW	
CHAR CHEV	ARROW- CHEVRON(S)	channelization- ctr symbol	V-NODE-ROAD-MRKG-ARRW	
CHAR MERG	ARROW- MERGE	channelization- ctr symbol	V-NODE-ROAD-MRKG-ARRW	
CHAR L	ARROW- LEFT	channelization- ctr symbol	V-NODE-ROAD-MRKG-ARRW	
CHAR LR	ARROW- LEFT/RIGHT	channelization- ctr symbol	V-NODE-ROAD-MRKG-ARRW	
CHAR LS	ARROW- LEFT/STRAIGHT	channelization- ctr symbol	V-NODE-ROAD-MRKG-ARRW	
CHAR LRS	ARROW- LEFT/RIGHT/STRAIGHT	channelization- ctr symbol	V-NODE-ROAD-MRKG-ARRW	
CHAR R	ARROW- RIGHT	channelization- ctr symbol	V-NODE-ROAD-MRKG-ARRW	
CHAR RS	ARROW- RIGHT/STRAIGHT	channelization- ctr symbol	V-NODE-ROAD-MRKG-ARRW	
CHSB	STOP BAR	channelization- loc ctr line	V-NODE-ROAD-MRKG-SLNE	
CHXW	CROSSWALK	channelization- locate perimeter of striping	V-NODE-ROAD-MRKG-XWLK	
CH2Y	DOUBLE SOLID YELLOW	channelization- loc ctr line	V-NODE-ROAD-MRKG-CNTR	
CHDS	DASHED/SOLID YELLOW	channelization- loc ctr line	V-NODE-ROAD-MRKG-LANE	
CHSY	SOLID YELLOW	channelization- loc ctr line	V-NODE-ROAD-MRKG-SLID	
CHDY	DASHED YELLOW	channelization- loc ctr line	V-NODE-ROAD-MRKG-LANE	
CHDW	DASHED WHITE	channelization- loc ctr line	V-NODE-ROAD-MRKG-LANE	

FIELD CODE	DESCRIPTION	DATA COLLECTION POINT	LAYER	BLOCK NAME
CHSW	SOLID WHITE	channelization- loc ctr line	V-NODE-ROAD-MRKG-SLID	
CHBL	BIKE LANE	channelization- loc ctr line	V-NODE-ROAD-MRKG-SLID	
CHFL	FIRE LANE	channelization- loc ctr line	V-NODE-ROAD-MRKG-FLNE	
CHPK	PARKING	channelization- loc ctr line	V-NODE-ROAD-MRKG-PRKG	
CHNP	NO PARKING	channelization- loc ctr line	V-NODE-ROAD-MRKG-NOPK	
CHBK	BIKE SYMBOL	channelization- ctr symbol	V-NODE-ROAD-MRKG-BIKE	
CHSC	SCHOOL SYMBOL	channelization- ctr symbol	V-NODE-ROAD-MRKG-SCHL	
CHHC	HANDICAP SYMBOL	channelization- ctr symbol	V-NODE-ROAD-MRKG-HDCP	
CHHV	HOV SYMBOL	channelization- ctr symbol	V-NODE-ROAD-MRKG-HOVL	
CHON	ONLY SYMBOL	channelization- ctr symbol	V-NODE-ROAD-MRKG-ONLY	
CHRR	RR XING SYMBOL	channelization- ctr symbol	V-NODE-ROAD-MRKG-RRXG	
CHST	STOP SYMBOL	channelization- ctr symbol	V-NODE-ROAD-MRKG-STOP	
CHBS	TRANSIT ONLY SYMBOL	channelization- ctr symbol	V-NODE-ROAD-MRKG-TRAN	
CHK	CHECK SHOT	loc. - survey info	V-NODE-CHCK	
CIP	CAST IRON PIPE (SIZE)	descriptive	V-NODE-STRM-UNDR	
CLF	CHAIN LINK FENCE (SIZE)	loc. / height	V-NODE-FENC-STEL	
CMH	COMMUNICATIONS MH	descriptive	V-COMM-MHOL	ecastc
CMP	CORRUGATED METAL PIPE (SIZE)	Invert (unless otherwise noted) - note material desc.	V-NODE-STRM-PIPE-CMTL	
CMRA	CAMERA LOCATION	loc. / directional ref. / description	V-CMRA	
CNDTR	CONDUCTOR (ELECTRICAL)	location	V-NODE-POWR-OVHD	
CO	CLEAN OUT (SIZE)	descriptive	V-SSWR-STRC	eco
COL	COLUMN (SIZE)	ctr. / size / material	V-TOPO-COLS	
COM	COMMUNICATIONS (LOCATION)	location - generic features	V-NODE-COMM-MRKG	
CONC	CONCRETE	descriptive	V-NODE-TOPO-CONC	

FIELD CODE	DESCRIPTION	DATA COLLECTION POINT	LAYER	BLOCK NAME
CPP	CORRUGATED PLASTIC PIPE (SIZE)	descriptive	V-NODE-UNDR	
CR	CROWN OF ROADWAY	note material desc.	V-NODE-BRKL	
CRK	CREEK-RIVER	thalwag	V-NODE-RIVR	
CTREE	CONIFER TREE (SIZE)	ctr. / size	V-PLNT-CONI	econf
CULV	CULVERT (ANY TYPE) (SIZE)	Invert (unless otherwise noted) - note material desc.	V-NODE-STRM-UNDR	
CVLT	COMMUNICATIONS VAULT	ctr. / size	V-NODE-COMM-STRC	
CW	CONCRETE WALK (SIZE)	corner / edge	V-NODE-SWLK-CONC	
D	DITCH (CENTERLINE)	ctr.	V-NODE-DTCH	
DBLP	DOUBLE LIGHT POLE	ctr (directional ref. If not parallel)	V-LITE-POLE	edblt
DDM	STORM DRAIN DETENTION MANHOLE	ctr. / size (calc.)	V-STRM-MHOL	ecastc
DECK	DECK (ANY TYPE)	corner / edge--NO ROOF	V-NODE-BLDG-DECK	
DIP	DUCTILE IRON PIPE (SIZE)	descriptive	V-NODE-PIPE	
DTREE	DECIDUOUS TREE (SIZE)	ctr. / size	V-PLNT-DECI	edecid
DWY	DRIVEWAY	corner / edge	V-NODE-DRIV	
E	EAST (direction)	descriptive	V-NODE	
EBLK	ECOLOGY (SIZE)	ctr., size and (directional ref.)	V-NODE	
ECD	ELECTRICAL CONDUIT	location	V-NODE-POWR	
ED	ELECTRICAL DUCT	location	V-NODE-POWR	
EHH	ELECTRIC HANDHOLE (SIZE)	ctr., size and (directional ref.)	V-POWR-JBOX	ehh
EINS	ELECTRICAL INSULATOR	location	V-NODE-POWR	
ELEC	ELECTRIC (LOCATION)	location - generic features	V-NODE-POWR-MRKG	
EMH	ELECTRIC MANHOLE	descriptive	V-POWR-MHOL	ecastc
ENT	ENTRYWAY / DOORWAY	location	V-NODE-TOPO-SPOT	
EOA	EDGE OF ASPHALT	corner / edge	V-NODE-ROAD-ASPH	
EOC	EDGE OF CONCRETE	corner / edge	V-NODE-ROAD-CONC	
EOG	EDGE OF GRAVEL	angle pnt. / edge	V-NODE-ROAD-GRVL	
EOW	EDGE OF WATER	angle pnt. / edge	V-NODE-TOPO-EWAT	

FIELD CODE	DESCRIPTION	DATA COLLECTION POINT	LAYER	BLOCK NAME
EVLT	ELECTRIC VAULT	descriptive	V-POWR-EQPM	evault
F	FENCE (ANY TYPE / SIZE)	loc. / height / material	V-NODE-FENC	
FGB	FENCE @ GB	loc. / height / material	V-NODE-FENC	
FF	FINISHED FLOOR ELEV.	location	V-NODE-TOPO-SPOT	espotel
FL	FLOW LINE	location	V-NODE-BRKL	
FO	FIBER OPTIC (UTILITY LOCATION)	location - LINE for paint marks, single SHOT for marker	V-NODE-FIBR-MRKG	
FOC	FACE OF CURB	location	V-NODE-ROAD-CURB	
FSTP	FIRE STAND PIPE	ctr. / size	V-NODE-FIRE-PIPE	
FTG	FOOTING	corner / edge	V-NODE-FNDN-FTNG	
G	GUTTER (CURB)	location	V-NODE-ROAD-CURB	
GAS	GAS (UTILITY LOCATION)	location - LINE for paint marks, single SHOT for marker	V-NODE-NGAS-MRKG	
GATE	GATE (ANY TYPE)	loc. / height	V-NODE-FENC	
GB	GRADE BREAK	location	V-NODE-BRKL	
GIP	GALVANIZED IRON PIPE	ctr. / size (note ie. or top)	V-NODE-PIPE	
GM	GAS METER	location	V-NGAS-INST	egm
GND	GROUND	location	V-NODE-TOPO-SPOT	
GP	GUY POLE	location (shot immediate after assoc. pole)	V-TOPO-POLE	egp
GREG	GAS REGULATOR	location	V-NGAS-INST	egreg
GRL	GUARD RAIL	location	V-NODE-FENC-GRAL	
GRS	GRASS/LAWN	descriptive	V-NODE-PLNT-TURF	
GRT	GRATE STEEL	ctr. / size DESC REQ	V-NODE-POWR-STRC	
GRVL	GRAVEL	descriptive	V-NODE-TOPO-GRVL	
GTV	GATE VALVE	loc. (ctr. nut) / size pipe	V-WATR-INST	evalve
GUY	GUY ANCHOR	location (shot immediate after assoc. pole)	V-TOPO-POLE	eguy
GV	GAS VALVE	location	V-NGAS-INST	evalve
HBR	HOSE BIB RISER (water)	ctr., size and (directional ref.)	V-NODE-FIRE-PIPE	

FIELD CODE	DESCRIPTION	DATA COLLECTION POINT	LAYER	BLOCK NAME
HDG	HEDGE ROW	location - at ends	V-NODE-PLNT-BUSH	
HH	HANDHOLE (GENERIC) (SIZE)	ctr., size and (directional ref.)	V-UNID	ehh
HT	HUB / TACK	loc. - survey info	V-CTRL	esvhub
HUB	SURVEY HUB	contruction staking	VF-NODE-TOPO-CSTG	
HWALL	HEADWALL	location - at ends	V-NODE-WALL	
HYD	FIRE HYDRANT	ctr. (directional ref.)	V-FIRE-HYDR	ehyd
IE	INVERT ELEVATION	invert elev. of all physical features other than culverts.	V-NODE-UNDR	
INL	INLET (SIZE)	ctr., size and (directional ref.)	V-STRM-STRC	einl250a
IP	IRON PIPE	descriptive	V-CTRL	esvrb
IRRG	IRRIGATION BOX	descriptive	V-IRRG-EQPM	
IRV	IRRIGATION VALVE	location	V-IRRG-VALV	eirrgv
JB	JUNCTION BOX (SIZE)	ctr., size and (directional ref.)-ELECTRICAL	V-POWR-JBOX	ejb
LATH	LATH SURVEY	construction staking	VF-NODE-TOPO-CSTG	
LID	CONC. LID	exposed conc. lid to vault, chamber, box	V-NODE	
LP	LIGHT POLE	ctr. (directional ref.)	V-LITE-POLE	elp
LS	LANDSCAPE	descriptive	V-NODE-PLNT-BEDS	
LT	LANDSCAPE TIMBER	ctr. / width	V-NODE-PLNT-EDGR	
LUM	LUMINAIRE	location	V-LITE-POLE	elum
MAG	MAG NAIL	loc. - survey info	V-CTRL	esvtk
MBOX	MAIL BOX (BLUE / US POSTAL)	ctr., size and (directional ref.) (U.S. Postal)	V-TOPO-MAIL	emailus
MH	MANHOLE (GENERIC)	descriptive	V-MHOL	ecastc
MC	MON CASE	location of casting only-ctr./size	V-TOPO-CTRL	ecastc
MIC	MONUMENT IN CASE	loc. - survey info	V-CTRL-HCPT	esvmic
MON	CONCRETE MONUMENT	loc. - survey info	V-CTRL-HCPT	esvmon
MPOLE	METAL POLE	location	V-TOPO-POLE	epp
MRKE	MARKER POST- ELEC)	ctr./ size/ desc- Utility (carsonite, conc, BC, etc)	V-POWR-MRKG	epost
MRKG	MARKER POST- GAS, PET, OIL	ctr./ size/ desc- Utility (carsonite, conc, BC, etc)	V-NGAS-MRKG	epost

FIELD CODE	DESCRIPTION	DATA COLLECTION POINT	LAYER	BLOCK NAME
MRKC	MARKER POST- COMM, FO	ctr./ size/ desc- Utility (carsonite, conc, BC, etc)	V-COMM-MRKG	epost
MRKW	MARKER POST- WATER	ctr./ size/ desc- Utility (carsonite, conc, BC, etc)	V-WATR-MRKG	epost
MW	MONITORING WELL	location	V-WATR-INST	emwell
N	NORTH (direction)	descriptive	V-NODE	
OHB	OVERHEAD BUILDING LINES	carports/bldgs-NOT IN TIN	V-NODE-BLDG-OVHD	
OHP	OVERHEAD POWER		V-NODE-POWR-OVHD	
PAD	CONC. PAD/SLAB	concret pad / slab - not vault lid	V-NODE-SLAB-CONC	
PATH	PATH / TRAIL	ctr. / width	V-NODE-SITE-TRAL	
PC	PIPE / CAP	loc. - survey info	V-CTRL	esvrb
PDP	PERFORATED DRAIN PIPE (SIZE)	ctr. / size (note ie. or top)	V-NODE-UNDR	
PEDSP	PEDESTRIAN SIGNAL PEDESTAL	location	VT-POWR-INST	epedp
PIER	PIER-STRUCTURAL	corner / edge	V-NODE-FNDN-PIER	
PIL	PILING	ctr. / size	V-NODE-FNDN-PILE	
PIPE	PIPE (GENERIC / SIZE)	ctr. / size (note ie. or top)	V-NODE-PIPE	
PK	PK NAIL	loc. - survey info	V-CTRL	esvtk
PM	PARKING METER	location	VT-PRKG-FIXT	eprkm
POLE	POLE (GENERIC / SIZE)	ctr	V-TOPO-POLE	epp
POST	POST (SIZE)	location / material	V-TOPO-POST	epost
PP	POWER POLE	location / material	V-POWR-POLE	epp
PPB	PEDESTRIAN PUSH BUTTON	location	VT-POWR-INST	eppb
PPBP	PEDESTRIAN PUSH BUTTON PEDESTAL	location	VT-POWR-INST	eppbp
PPLT	POWER POLE W/ LIGHT	ctr. (directional ref.)	V-POWR-POLE	epplt
PRKG	PARKING AREA	corner / edge	V-NODE-PKRG	
RBOX	RECORDING BOX (water)	ctr., size and (directional ref.)	V-WATR-INST	ecab
RC	REBAR / CAP	loc. - survey info	V-CTRL	esvrb
RDWY	ROADWAY-UNPAVED	location	V-NODE-ROAD-UPVD	
RET	RETAINING WALL (ANY TYPE)	top center of ret-wall @ angle pts. and GB's	V-NODE-WALL-RTWL	

FIELD CODE	DESCRIPTION	DATA COLLECTION POINT	LAYER	BLOCK NAME
RIP	RIPRAP	location - perimeter	V-NODE-RRAP	
RIT	ROUND INLET TOP (SIZE)	ctr. / size	V-STRM-STRC	ecb-rnd
RKY	ROCKERY (SIZE)	location - perimeter	V-NODE-SITE-ROCK	
RLNG	RAILING	loc. / height	V-NODE-TOPO	
RMAIL	MAIL BOXES (RESIDENTIAL)	ctr., size and (directional ref.) (each end rack)	V-TOPO-MAIL	emailpvt
ROCK	ROCK (ANY TYPE)	ctr., size and (directional ref.)	V-SITE-ROCK	erock
RR	RAILROAD (LOCATION)	location - generic features - DESC REQ	V-NODE-RAIL	
RRAIL	RAILROAD RAIL (TOP CENTER)	location - top center	V-NODE-RAIL-TRAK	
RRF	RAILROAD FROG	location	V-NODE-RAIL-EQPM	
S	SOUTH (direction)	descriptive	V-NODE	
SAN	SANITARY (location)-UTILITY LOCATES	location - generic features	V-NODE-SSWR-MRKG	
SB	SAND BOX	ctr., size and (directional ref.)	V-STRM-STRC	esb
SCRB	SURVEY SCRIBE MARK	loc. - survey info	V-NODE-CTRL	
SD	SERVICE DRAIN	size-outlet drain at curb or downspouts	V-NODE-STRM-UNDR	
SDMH	STORM DRAIN MH	ctr. / size	V-STRM-MHOL	ecastc
SFB	SEE FIELD BOOK	survey info	V-NODE-ANNO	
SH	SPRINKLER HEAD	location	V-IRRG-SPKL	esprkhd
SHLDR	SHOULDER	location - note material desc.	V-NODE-ROAD-UPVD	
SHRUB	SHRUB (ANY TYPE / SIZE)	ctr., size and (directional ref.)	V-PLNT-SHRB	eshrub
SIGN	SIGN (ANY TYPE)	location---description	V-TOPO-SIGN	esns
SL	STREET LIGHT	location (directional ref.)	V-LITE-POLE	elp
SLHH	STREET LIGHT HH	ctr., size and (directional ref.)	V-LITE-JBOX	ehh
SMH	SANITARY SEWER MANHOLE	descriptive	V-SSWR-MHOL	ecastc
SP	STRAIN POLE	location	V-POWR-POLE	esp
SPK	SPIKE (SURVEY PNT.)	loc. - survey info	V-CTRL	esvpk
SPLT	STRAIN POLE W/ LIGHT	location (directional ref.)	V-POWR-POLE	esplt
STM	STEAM (UTILITY LOCATION)	location - LINE for paint marks, single SHOT for marker	V-NODE-STEM-MRKG	

FIELD CODE	DESCRIPTION	DATA COLLECTION POINT	LAYER	BLOCK NAME
STEP	STAIRWAYS	location - btm. of btm. step and top of top step	V-NODE-STRS	
STK	STAKE (SURVEY PNT.)	loc. - survey info	V-NODE	
STLP	STEEL PIPE (SIZE)	location	V-NODE-PIPE	
STMH	STEAM MANHOLE	descriptive	V-STEM-MHOL	ecastc
STRM	STORM (UTILITY LOCATION)	location - LINE for paint marks, single SHOT for marker	V-NODE-STRM-MRKG	
STUMP	STUMP (SIZE)	ctr. / size	V-PLNT	estump
SV	SPRINKLER VALVE	location	V-IRRG-EQPM	evalve
SWALE	SWALE	location	V-NODE-STRM-DTCH	
TB	TEST BORE	loc. - survey info	V-TOPO-BORE	etb
TC	TREE CANOPY	location	V-NODE-PLNT	
TCD	TELEPHONE CONDUIT	location	V-NODE-COMM	
TD	TELEPHONE DUCT	location	V-NODE-COMM	
TEB	TELEPHONE ENCLOSURE BOX (SIZE)	ctr., size and (directional ref.)	V-COMM	etelencl
TEL	TELEPHONE (UTILITY LOCATION)	location - LINE for paint marks, single SHOT for marker	V-NODE-COMM-MRKG	
THWG	THALWEG	ctr line creek/creek bed	V-NODE-RIVR	
TK	TACK	loc. - survey info	V-CTRL	esvtk
TL	TACK / LEAD	loc. - survey info	V-CTRL	esvtk
TLC	TACK / LEAD (COPPER TACK)	loc. - survey info	V-CTRL	esvtk
TOE	TOE (GROUND)	location	V-NODE-BRKL-BOTB	
TOP	TOP (GROUND)	location	V-NODE-BRKL-TOPB	
TP	TELEPHONE POLE	location	V-COMM-POLE	etp
TPED	TELEPHONE PEDESTAL	ctr., size and (directional ref.)	V-COMM	etelencl
TR	TRASH RACK	ctr., upstream edge	V-NODE-STRM-STRC	
TRL	TRAFFIC SIGNAL LOOPS	ctr, size and multiple corners	V-NODE-TRAF-INST	
TRSB	TRAFFIC SIGNAL CONTROL BOX	ctr., size and (directional ref.)	VT-POWR-INST	ecab
TRSG	TRAFFIC SIGNAL ON SPAN WIRE	location	VT-POWR-INST	esignbk
TRSP	TRAFFIC SIGNAL POLE	location	VT-POWR-	etrsp

FIELD CODE	DESCRIPTION	DATA COLLECTION POINT	LAYER	BLOCK NAME
			POLE	
TSA	TRAFFIC SIGNAL MAST ARM		VT-POWR-INST	esig
TCHH	TRAFFIC CONTROL HH	ctr., size and (directional ref.)	V-TRAF-JBOX	ehh
UG	UNDERGROUND	below ground surface (excluding Inverts)	V-NODE-UNDR	
UGS	UNDERGROUND SERVICE	descriptive	V-NODE-UNDR	
UP	UTILITY POLE	location	V-UTIL-POLE	epp
UTIL	UTILITY CORRIDOR	location	V-NODE-UTIL	
UW	UNDER WATER	descriptive	V-NODE-TOPO	
VENT	VENT (any type / size)	location (height) - generic features	V-NODE	
VL	VEGETATION LINE	location	V-NODE-PLNT	
VLT	VAULT (ANY TYPE / SIZE)	descriptive	V-NODE-STRC	
W	WEST (direction)	descriptive	V-NODE	
WALL	WALL (ANY TYPE)	ctr., size and (directional ref.)	V-NODE-WALL	
WCR	WHEEL CHAIR RAMP	corner	V-NODE-SWLK-RAMP	
WEIR	WEIR	location	V-NODE-WEIR	
WF	WETLAND DELINEATION	location (marker number)	V-WETL	eflag
WGV	WATER GATE VALVE CHAMBER	manhole location	V-WATR-MHOL	ewgv
WIF	WROUGHT IRON FENCE (SIZE)	location (height)	V-NODE-FENC-STEL	
WIFGB	WROUGHT IRON FENCE @ GB	location (height)	V-NODE-FENC-STEL	
WMH	WATER MH	descriptive	V-WATR-MHOL	ecastc
WML	WATER METER BOX (LARGE)	ctr., size and (directional ref.)	V-WATR-INST	ewm
WMS	WATER METER BOX (SMALL)	ctr., size and (directional ref.)	V-WATR-INST	ewm
WMR	WATER METER BOX (ROUND)	ctr., diameter	V-WATR-INST	ewm
WP	WOOD POLE	location	V-POWR-POLE	epp
WSTP	WHEEL STOP - PARKING	ctr. / width	V-NODE-PRKG-FIXT	
WTR	WATER (UTILITY LOCATION)	location - LINE for paint marks, single SHOT for marker	V-NODE-WATR-MRKG	
WTS	WATER TEST STATION	ctr., diameter	V-NODE-WATR-INST	

FIELD CODE	DESCRIPTION	DATA COLLECTION POINT	LAYER	BLOCK NAME
WV	WATER VALVE	location (sml. Casting)	V-WATR-INST	evalve
WVLT	WATER VAULT (SIZE)	descriptive	V-NODE-WATR-STRC	
XA	EXTRUDED ASPH EDGE	corner / edge	V-NODE-ROAD-ASPH	
XC	EXTRUDED CURB	inside (face) corner / edge	V-NODE-ROAD-CURB	
XJ	EXPANSION JOINT	location (bridge, etc.)	V-NODE-EXPJ	
XP	TRANSMISSION POLE	ctr. / size	V-POWR-POLE	exp

Section 8: Electronic Transmittals (eTransmit)

AutoCAD Civil 3D enables you to package up a set of files for Internet transmission with the eTransmit tool. Here is our recommendation for eTransmit settings in Civil 3D 2009:

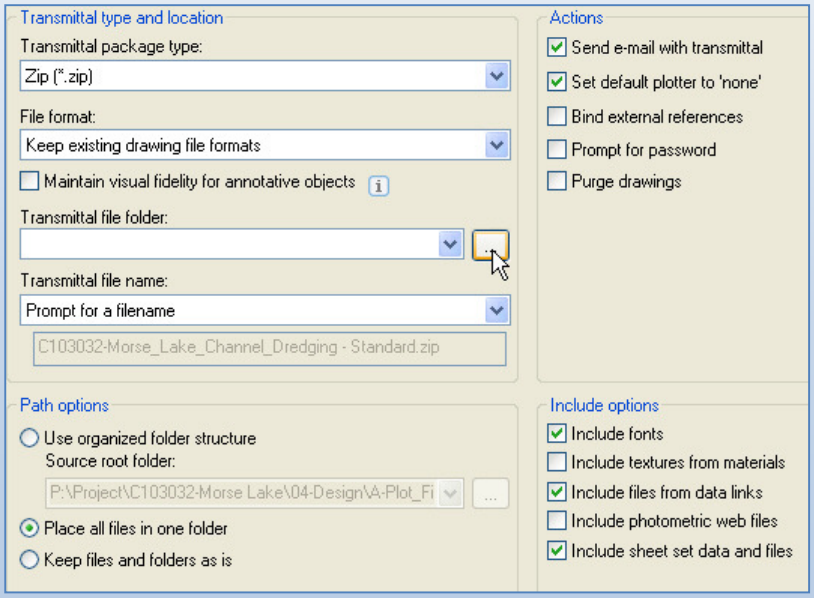
- We prefer to receive the file package in Zip format
- Make sure files follow our file naming convention
- We typically like to receive all the files in one folder
- Include files from data links
- Include sheet set data and files
- Include data shortcuts (you may need to manually include these files)

Tip: Recommended eTransmit Settings

Start eTransmit by opening a drawing that you would like to transmit and typing ETRANSMIT on the command line or by right clicking on a sheet set (command: SSM) and selecting eTransmit.

Click the "Transmittal Setups…" button in the "Create Transmittal" dialog box and click the "Modify…" button in the "Transmittal Setups" dialog box.

Here is an example of a preferred transmittal setup:



Email vs. FTP Transmittals

Please note that our email system typically blocks incoming emails from outside sources containing Zip files. To get around this, once the Zip file package has been created you will need to rename it from .zip to .zap so the email will get to us.

Of course if there are a lot of large files you will not be able to send them via email. Instead you will most-likely need to upload the file package to an FTP server.

Tip: Connect To Seattle Public Utility's FTP Server

The SPU FTP server is: ftp.seattle.gov/exchange/spu/engineering/

Username: seattle/ftp_spuengcon
Password: engine118

The best practice is to create a sub folder specifically for your project. Data uploaded to this site will usually be deleted 7 to 10 days following posting.

Section 9: Support Files

To download support files, visit http://www.seattle.gov/util/Engineering/CAD_Resources/

We periodically update this web page with the latest templates, documentation, and support files.